

Reconnect Webinars

Fact Sheet – updated June 2023



beyond the screen



INTRODUCTION

Reconnect Webinars provide evidence-based research on the impact of technology on human development, behaviour, and productivity.

This fact sheet highlights the studies on this topic.



Statistics and Expert Guidelines *pages 5-7*

Screen usage statistics

Screen expert guidelines

Child Development *pages 8-12*

Movement

Movement expert guidelines, vestibular/proprioceptive input, literacy impact.

Touch

Tactile stimulation/deprivation, anxiety.

Human connection

Attachment, trauma, childhood adversity.

Nature

Parasympathetic activation, behaviour management, productivity.

Technology Impact Research *pages 13-39*

Physical Development

Obesity/diabetes, developmental delay, sleep, myopia/vision, cardiovascular, posture, breath, headaches.

Social Development

Social relationships, social media, video games, pornography, sexting/sexortion.

Emotional Development

Self-regulation/motivation, resilience/risk, aggression and violence, cyberbullying, hate crimes/radicalization, data privacy/security.

Mental Development

Mental health, anxiety/depression/suicide, autism, screen addiction, psychotropic medication.

Cognitive Development

Executive function, attention deficit, learning disorders, multitasking, academic performance, screens in schools, Covid effect, outdoor schools, brain injury.

Wireless Radiation and Humans *pages 40-46*

Wireless expansion

Wireless controversy

Wireless safety

Experimental Research

Epidemiological studies

Cancer incidence statistics

Wireless expert recommendations

Wireless government initiatives

Balanced Technology Management Initiatives *pages 47-50*

Home and families

Family relationships, parent involvement, support networks

Schools

Screen management policies, outdoor schools, playgrounds, recess

Clinic

Mandatory screening for screens, parent education, unplug-don't drug

Government

Municipal, provincial/state, federal

Researchers

Technology production corporations

Do no harm, warnings, age limits, funding for projects

Workplace Ergonomics *pages 50-52*

Nature and Greenspace

Productivity and Breaks

Ergonomic Musculoskeletal Injury Prevention

Posture

Exercise and Fitness

Mental Health

Technology Overuse

Research References (over 400) *pages 53-86*

STATISTICS AND EXPERT GUIDELINES

Nielsen Ratings 2021 report includes data from 40,000 individuals and indicates adults > 18 years consumed on average 12:21 hours per day of entertainment-based screen content. [The Nielsen Total Audience Report: August 2020.](#)

UK survey of 2167 5-16-year-olds said 53% of children owned a cell phone by age 7 years and by 11 years, 90% had their own phone, 57% of children slept with their phone by their bed and 39% said they could not live without their phone. [Childwise Monitor, 2020.](#)

Children from birth to 23 months old are watching TV for 55 minutes per day, and 2-4-year-olds are watching 90 minutes per day. Also, 38 % of all children below 2 years old have now used a mobile device for any media activity compared to 10% 2 years ago. [Lerner & Barr, 2014.](#)

The average seven-year-old will have already spent more than a year of 24-hour days watching screen media; the average European adolescent will have spent four years of 24-hour days in front of a screen by the age of eighteen. [Sigman, 2012.](#)

Males used the Internet for a wider range of purposes than females, including games and leisure. [Joiner, 2012.](#)

Elementary aged children now use an average 7.5 hours per day entertainment technology and two thirds of children report their parents do not restrict their access to technology. [Kaiser Foundation Report, 2010.](#)

Preschoolers' total screen time exceeds recommendations and most previous estimates. [Tandon, 2010.](#)

Around 40% of children watched television, DVDs, or videos on a regular basis by the age of three months. Within 24 months, this percentage had risen to 90%. Half of the time, parents watched with their children. [Zimmerman, 2007.](#)

The average American household has the TV on 6 hours a day; children from heavy-television households watched more television and read less than their peers. [Vandewater, 2005.](#)

Children aged six and under spend an average of two hours a day with screen media; many parents believe that media has a positive impact on their children. [Rideout, 2003.](#)

"Kids & Media" is the first extensive national evaluation report of children's media consumption. [Rideout, 1999.](#)

Expert Guidelines

The following Technology Use Guidelines for children and youth were developed by Cris Rowan pediatric occupational therapist and author of Virtual Child, Dr. Andrew Doan neuroscientist and author of Hooked on Games and Dr. Hilarie Cash, Director of reSTART Internet Addiction Recovery Program and author of Video Games and Your Kids, with contribution from the American Academy of Pediatrics and the Canadian Pediatric Society in an effort to ensure sustainable futures for all children.

Technology Use Guidelines for Children and Youth

Developmental age	How much?	Non-violent TV	Handheld devices	Non-violent video games	Violent video games	Online violent video games and pornography
0-2 years	none	never	never	never	never	never
3-5 years	1 hour/day	okay	never	never	never	never
6-12 years	2 hours/day	okay	never	never	never	never
13-18 years	2 hours/day	okay	okay	30 min/day	never	never

Canadian Pediatric Society in 2017 recommends no screens for children 0-2 years, no more than 1 hour per day ages 3-5 and no more than 2 hours per day 6-12 years. [CPS 2017](#). CPS “softened” technology usage guidelines for pre-school children asking parents to focus more on content and less on duration. [CPS, 2022](#).

TV viewing is linked to a variety of negative health outcomes; to reduce the majority of the associated adverse health events, future guidelines could recommend limiting TV time to less than 2 hours per day. [Foster, 2020](#).

The Canadian 24-Hour Movement Guidelines for Children and Youth recommend at least 60 min physical activity/day, < 2 hrs recreational screen time/day, and 9–11 hrs. sleep per night in children aged 8–11 years all associated with superior global cognition. [Walsh, 2018](#).

The American Academy of Pediatrics in 2016 released a policy statement called Virtual Violence regarding the causal impact of violent media content on consequent aggressive behavior, recommending no violent media exposure for children less than 6 years of age, and no first-person online shooter games for ANY child. [AAP, 2016](#).

Pediatricians are encouraged to take a media history and ask 2 media questions at every well-child visit and reiterate 2004 AAP policy of no technology exposure for children 0-2 years of age, and 1-2 hours of total technology per day ages 2-18 years. [AAP, 2013](#).

AAP policy statement says safe and well-supervised recess offers cognitive, social, emotional, and physical benefits that may not be fully appreciated when a decision is made to diminish it. Recess is unique from, and a complement to, physical education—not a substitute for it. The American Academy of Pediatrics believes that recess is a crucial and necessary component of a child’s development and, as such, it should not be withheld for punitive or academic reasons. [Murray, 2013](#).

Children 0-2 years old should not be exposed to any technologies (even background TV), 3-5 years restricted to one - our total technology per day, and 6-18 years be restricted to 2 hours total technology per day. [American Academy of Pediatrics 2001 and 2013](#)).

Children less than two years old should not watch or be exposed to any TV or video games, [American Academy of Pediatrics 2001](#), and children older than two should restrict usage to one hour per day if they have any physical, mental, social, or academic problems, and two hours per day maximum if they don't. [American Academy of Pediatrics, 2006](#).

CHILD DEVELOPMENT – FOUR CRITICAL FACTORS FOR GROWTH AND SUCCESS

Movement

In high-income nations, more screen time and less physical exercise were related to lower life satisfaction and more psychosomatic issues among teenagers. [Khan, 2021](#).

The prevalence of plagiocephaly in infants aged 7 to 12 weeks has been estimated to be 46.6%. [Mawji, 2013](#).

Installing Fitness Zones in parks in densely populated areas with limited facilities tends to be cost-effective and most effective. [Cohen, 2012](#).

Stereotypy, aggressiveness, off-task behaviour, and elopement were all reduced in a study of children with autism who exercised. [Lang, 2010](#).

Two-thirds of the over 400 members interviewed indicated they've noticed an increase in early motor delays in infants. [Jennings, 2005](#).

Toddlers aged three did only 20 minutes of moderate to vigorous exercise per day. [Reilly, 2004](#).

Movement Stats and expert guidelines

Physical activity accounted for 25% of children's activities, while sedentary activities accounted for 51% and indoor activities accounted for 81 percent. [Engelen, 2014](#).

The findings show that, while rough and tumble (R&T) play is thought to be beneficial to young children's development, instructors are unsure of how to control it. The findings of this study highlight the necessity for early childhood programs to adopt policies that guide the management of R&T. [Tannock, 2008](#).

Vestibular and proprioceptive input

Sensory integration dysfunctions, slow vision processing, decreased hearing, and reading difficulty are all related to delayed vestibular maturation. [Solon, 2007](#).

The Test of Ideational Praxis is a reliable assessment tool that is the first objective evaluation for identifying ideational abilities. [May-Benson, 2007](#).

The gaze instability caused by vestibular hypofunction affects reading ability in young children. [Braswell, 2006](#).

In children with sensorineural hearing loss and vestibular dysfunction, an exercise intervention focusing on improving sensory integrative postural control abilities is beneficial in halting the progression of motor development delay. [Rine, 2004](#).

Literacy impact

“Handbook of Writing Research” synthesises current information on writing development and training at all grade levels, making it the essential reference in the field. [MacArthur, 2016.](#)

Teachers spend an average of 14 minutes per day teaching handwriting, significantly less than the 45 minutes per day mandated in the 1980s and slightly less than the 45 minutes per day spent in the 1960s and 1970s. [Graham, 2008.](#)

This article discusses some key aspects of digital reading, with a focus on the critical function of our bodies, particularly our fingers and hands, in creating an immersive fiction reading experience. [Mangen, 2008.](#)

“Best Practices in Writing Instruction” transforms cutting-edge research into practical writing instruction for students in grades K–12. [Graham, 2007.](#)

Handwriting is causally linked to writing, and explicit and additional handwriting teaching in the elementary grades is a crucial component in preventing writing issues. [Graham, 2000.](#)

Children who received traditional teaching in handwriting generated more legible handwriting than individuals who received whole-language instruction in handwriting, and they were able to write significantly more words under time constraints. [Goldberg, 1999.](#)

Significant progress was achieved between 1980 and 1994 in understanding the mechanisms involved in controlling and developing handwriting, as well as in instructing children with writing issues. [Graham, 1996.](#)

Touch

Tactile stimulation/deprivation

Sensory integration theory: Improving the processing and integration capacity of sensory stimuli may affect adaptive behavior and occupational performance. [Schaaf, 2007.](#)

Skin-to-skin contact has a favorable impact on mother-child interactions in infancy and into children’s middle childhood. [Bigelow, 2020.](#)

Touch deprivation may have an influence on quality of life for persons who have less social contact. Human to non-human interactions, such as those between animal guardians and their pets, may help to promote health and wellness. [Young, 2020.](#)

Touch massage was perceived as a necessary need and a pleasant and dynamic experience that influences self-awareness. [Lindgren, 2014.](#)

Differences in response to tactile stimuli are common in ASD, and tactile contact in early infancy is the basis of the development of social and communication skills in ASD. [Foss-Feig, 2012.](#)

According to a study on phenotypes within sensory modulation dysfunction, the first subtype is characterized by sensory seeking/craving, hyperactivity, impulsive, externalizing, unsocial, maladaptive, and impaired cognitive/social behaviour; the second subtype is characterized by emotional withdrawal, movement sensitivity, and low energy/weak behaviour. [James, 2011.](#)

Early childhood sensory deprivation is positively associated with developmental delay. [Ardiel, 2010.](#)

Early sensory sensitivities in infants are associated with sensory over-reactivity status at school-age. [Ben-Sasson, 2010](#).

Technology overuse may result in sensory over-reactivity. [Rowan, 2010](#).

The study looked at the involvement of touch in early development, touch deprivation, reluctance to touch, emotions that can be expressed through touch, the need for touch in interpersonal relationships, and how friendly touch influences compliance in different situations. [Field, 2010](#).

There are three global forms of maternal touch in natural caregiving (affectionate, stimulating, and instrumental) that evolve during the first year as mother-infant reciprocal communication develops. [Ferber, 2008](#).

Sixty-nine percent of ADHD boys were classified as tactile defensive. [Parush, 2007](#).

Kangaroo care had a substantial positive impact on the development of the infant's perceptual-cognitive and motor abilities, as well as on the parenting process. [Feldman, 2002](#).

The ethical framework for research on severely disadvantaged children; epigenetic factors in brain development, damage, and sensory deprivation; neuroendocrinology of stress, cognitive development, and growth; stress hormone and physical and psychological development in 2–3 year old in Leagane; and stress hormone and psychiatric and memory disorders are among the topics covered in this chapter. [Carlson, 1997](#).

Early isolation that is sufficiently severe and long-lasting reduces monkeys to a social-emotional stage where fear is the primary social reactivity. [Harlow, 1965](#).

Anxiety reduction

When the children and parents worked together during robot therapy, the parent's ability to adequately acknowledge the patient's pain appeared to reduce pain and emotional anxiety. [Okita, 2013](#).

Human connection

Excessive social media use leads to relationship conflicts, negative outcomes and screen addiction. [Bouffard 2021](#).

Prolonged use of social networking sites can adversely affect their academic performance, social interactions, and sleep duration. [Kolhar 2021](#).

The number one factor required to achieve happiness and longevity is human connections. [Waldinger, 2017](#).

Taking a break from Facebook has positive effects on the two dimensions of well-being: our life satisfaction increases and our emotions become more positive. [Tromholt 2016](#).

Parents in Canada spend an average of 3.5 minutes each week conversing with their children in a meaningful way. [Turcotte, Statistics Canada, 2007](#).

In the majority of children, continued Parent-Child Embrace Therapy resulted in significant and long-term improvements in symptomatic behaviour. [Welch, 2006](#).

Background noise, the length of time parents or caregivers spend talking to a child, and the style a parent speaks to a child are all directly responsible for the development of a child's ability to speak. [Ward, 2004](#).

Attachment formation

Early-life deprivation was more closely related to the domains of inhibitory control and working memory than *early-life threat*; Early-life adversity was associated with decreased executive functioning in children and adolescents. [Johnson, 2021.](#)

The interaction of attachment and psychopathology portends problematic Internet use earlier in life than that associated with problem alcohol use. [Shin, 2011.](#)

Humans are a "social animal."; the neurological foundation of attachment has been studied at a molecular, cellular, and systems level. [Insel, 2001.](#)

When children lack touch and human connection, they may 'turn in' (depression, anxiety) or 'turn out' (aggression). [Montagu, 1986.](#)

Childhood adversity

Childhood adversity resulted in deaths related to heart disease, cancer and chronic lower respiratory disease, and can be attributed to more than 1 in 3 suicide attempts. [Grummitt, 2021.](#)

"*Our National Obsession with Toddlers and Tiaras*" addresses the issue of child beauty pageants and discusses the reasons behind their popularity. [Howell, 2013.](#)

Although the symptoms of pervasive developmental disorder (PDD) and reactive attachment disorder (RAD) are similar, the existence of pathological care and a positive response to treatment in RAD can be helpful in distinguishing PDD from RAD. [Mukaddes, 2000.](#)

Nature

Higher screen time at age 2 years was directly associated with poorer communication at age 4 years. It was also associated with daily living skills, but frequency of outdoor play at age 2 years 8 months alleviated it, suggesting outdoor play mitigated the association between higher screen time and suboptimal neurodevelopment. [Sugiyama, 2023.](#)

Current literature supports a positive relationship between nature contact and children's health, especially for physical activity and mental health, both public health priorities. The evidence supports pediatricians in advocating for equitable nature contact for children in places where they live, play, and learn. [Fyfe-Johnson, 2021.](#)

Study reports that children who play freely in the great outdoors are healthier in body and mind and active engagement with the natural environment reduces stress and relieves depression in all ages. Article recommends physicians prescribe outdoor play for children. [Bravender, 2020.](#)

It has been proven that spending at least 120 minutes per week in nature improves health and well-being. [White, 2019.](#)

Synthesis suggested that passive nature exposure promotes positive changes in attention, memory and mood. [Norwood, 2019.](#)

Provision of structural and loose play equipment after a period of 6 months resulted in a 23.3% increase in children engaging in *moderate to vigorous* physical activity during recess and 26.2% increase in children engaged in *vigorous* physical activity. These increases were sustained at 1 year from baseline, with an increase of additional 17.2% for *moderate to vigorous* physical activity and 33.1% for *vigorous* physical activity. [Frost, 2018.](#)

These findings suggest that greenspace has a positive impact on a variety of health outcomes. [Twohig-Bennett, 2018](#).

AAP policy statement says safe and well-supervised recess offers cognitive, social, emotional, and physical benefits that may not be fully appreciated when a decision is made to diminish it. Recess is unique from, and a complement to, physical education—not a substitute for it. The American Academy of Pediatrics believes that recess is a crucial and necessary component of a child’s development and, as such, it should not be withheld for punitive or academic reasons. [Murray, 2013](#).

Overexposure to television and video games may cause children to lose contact with themselves, others, and nature; children are increasingly afraid of nature, which limits outside play, which is necessary for sensory and motor development. [Louv, 2010](#).

Parasympathetic activation

The parasympathetic heart rate variability score was higher in about 80% of those who viewed at a forest landscape. [Kobayashi, 2015](#).

Faster recovery after surgery, reduced blood pressure and heart rate, lower stress hormone levels, increased parasympathetic nervous system activity, and inhibition of the sympathetic nervous system are just a few of the many benefits of spending time in nature. [Phillips, 2001](#).

Behaviour management

According to the findings of this cohort study, a high proportion of parents and school-aged children reported no outdoor play 1 to 3 months after a brief, rigorous lockdown, which was more prevalent in lower-income homes. [Sum, 2022](#).

Jaak Panksepp coined the term “Affective Neuroscience” and distinguished seven basic emotional systems called SEEKING, CARE, PLAY, LUST, FEAR, SADNESS, and ANGER. [Davis, 2019](#).

Students with greater than 15 minutes per day of recess had teacher reports of better classroom behavior. [Barros, 2009](#).

The use of physical and chemical restraints is on the rise as a result of school management challenges with a growing number of aggressive children. [Gaskin, 2007](#).

Productivity

In order to preserve or improve upon employee well-being and work performance, breaks are necessary to recover from work demands, prevent burn-out and create a positive work-environment [Lyubykh et al., 2022](#).

More frequent universal-type work breaks yield positive effects on both employee health and performance in stressful work environments and increase overall job satisfaction [Scholz et al., 2018](#).

Building in frequent work breaks for highly demanding occupations have a significant impact on overall mood, cognitive performance and neurophysiological state when compared to those who also work in highly demanding work environments without frequent breaks [Scholz et al., 2018](#).

Nature exposure improves academic performance, personal growth, and environmental responsibility. [Kuo, 2019](#). Access to green spaces in or around workplaces increases work productivity as improves physical and mental health.

Within small worksite environments, frequent shorter work breaks and stretching exercises improved productivity, eye, leg and foot comfort [Henning et al., 1997](#).

TECHNOLOGY IMPACT RESEARCH

Physical

Obesity and diabetes

When compared to baseline, individualistic, family, and school-based obesity interventions were successful in lowering BMI by 0.46 and lowering obesity prevalence by 27.0 percent. [Aris, 2022](#).

During the first year of COVID-19, the number of new cases of pediatric type 2 diabetes increased by 182 percent. [Monostra, 2021](#).

Overweight/obese children spent more time at low intensity during gameplay, but less time at vigorous level, and made less motions. [Hwang, 2019](#).

Exposure to screen media leads to obesity in children and adolescents through increased eating while watching. [Robinson, 2017](#).

Instagram's healthy eating community has a high incidence of orthorexia symptoms, with more frequent Instagram use associated with increased symptoms. [Pixie, 2017](#).

Weight dissatisfaction, the desire for thinness, thin ideal internalization, and self-objectification were all linked to Facebook usage by teen girls. [Meier, 2014](#).

In the United States, 31.8 percent of children and adolescents are overweight or obese, with 16.9 percent of children and adolescents being obese. [Ogden, 2014](#).

Body image avoidance was linked to both male and female Internet addiction symptoms, as well as being a strong predictor of disordered eating in women. [Rodgers, 2013](#).

Researchers found no increase in physical activity with active video games, possibly due to minimal effort when playing games and/or children being less physically active during the rest of the day. [Baranowski, 2012](#).

Over the past 25 years, the prevalence of obesity has nearly tripled, with up to 26% of young children (ages 2 to 17) overweight or obese, and 41% of their Aboriginal peers. [Lipnowski, 2012](#).

Watching TV in excess of 2 hours daily is associated with deterioration of physical and psychosocial health, and shortening the time spent sitting lowers BMI. [Tremblay, 2011](#).

Research shows that 70% of Hispanic children have a TV in their bedroom, which increases the risk of obesity by 30%, increases TV use by an hour a day, and increases their consumption of junk food. [Feng, 2011](#).

Childhood obesity is a growing problem; this study suggests a framework for understanding child protection concerns in obese children. [Viner, 2010](#).

Mothers' perceptions of neighborhood safety were related to the television viewing time of their preschool children,

but not to their outdoor playtime or risk of obesity. [Burdette, 2005.](#)

Obesity rates in toddlers aged 2 to 5 years old have doubled in the United States, rising from 2.1 percent to 5.0 percent in boys and 4.8 percent to 10.8 percent in girls over a 6-year period, according to a study. [Harvey-Berino, 2003.](#)

The association between childhood obesity and physical inactivity in Canadian children is supported by this study. [Tremblay, 2003.](#)

The findings show that over the previous 15 years, the prevalence of overweight and obesity has increased dramatically in Canada, with the problem being more prominent among children; obesity affected 10% of Canadian children aged 7 to 13 in 1996, costing the economy \$ 1.8 billion. [Tremblay, 2002.](#)

Childhood obesity is on the rise. Long periods of time spent watching TV or playing video games are among the preventable causes of an increased BMI. [Strauss, 2001.](#)

Reduced usage of television, videotapes, and video games could be a promising population-based strategy for preventing childhood obesity. [Robinson TN, 1999.](#)

Developmental delay

Perinatal depression and anxiety in mothers have been shown to be negatively related to offspring development, making them important targets for prevention and early intervention to support mothers in parenting and the health and well-being of the next generation's offspring. [Rogers, 2020.](#)

Opinion paper summarizes research on the causal relationship between intensive early screen exposure of more than 4 hours per day prior to the age of six and neurodevelopmental disorders, specifically autism spectrum disorder; the author suggests a 3-month screen-free trial for all children who exhibit neurodevelopmental delays. [Harlé, 2019.](#)

Among the 2,441 children analyzed, the higher screen time levels at months 24 and 36 were substantially related with lower performance on developmental screening tests at month 36. [Madiqan, 2019.](#)

Device use in child bedrooms results in negative child developmental outcomes [\(Fu et al., 2017\)](#)

Increased videogame play is associated with delayed development (lower brain tissue density and cell structure) of the microstructure in extensive brain regions and verbal intelligence, either directly or indirectly. [Takeuchi, 2016.](#)

In general, participants who used devices such as tablet computers or portable multimedia players quickly acquired verbal repertoires. When comparing these devices to picture exchange or manual sign language, studies found that using a tablet computer was often faster. [Lorah, 2015.](#)

Infants exposed to adult TV programs from age six to 18 months had higher pervasive developmental problems, oppositional defiant behaviours scores, emotional reactive problems, aggression, and externalizing behaviors. [Chonchaiya, 2015.](#)

Increased screen time exposure in infancy is associated with ASD where the infant develops skills that are driven by screen viewing, resulting in global developmental delay. [Heffler, 2015.](#)

As the number of children with disabilities caused by physical conditions decreased, the number of children with disabilities caused by neurodevelopmental or mental health issues increased dramatically. [Houtrow, 2014.](#)

Background TV reduces words per minute, utterances per minute, and number of new words in toddlers. [Pempek, 2014.](#)

In-utero exposure to cell phone radiation in mice, caused frontal cortex change, hyperactivity, and impaired memory. [Aldad, 2012.](#)

Sensory abnormality (a very common symptom in autism in young children), has been proposed for inclusion among the diagnostic criteria for ASD in the upcoming DSM-V. [Klintwall, 2011.](#)

The association between infant television viewing and delayed language development may be explained by a decrease in exposure to human adult speech and a decrease in child vocalisations. [Christakis, 2009.](#)

Only 55-65 percent of developmental disorders are discovered prior to school age enrollment, and one out of every six children has a developmental disability. [Hamilton, 2006.](#)

A developmental impairment was found in 32% of children admitted to an inpatient paediatric unit. [Petersen, 2006.](#)

The effect of age on neural development appears to be more pronounced below 9-10 years of age than after this age. More research is needed on age-related changes in school age. [Korkman, 2001.](#)

[Brain Damage](#)

Higher ScreenQ scores (parent reported media use) were correlated with lower microstructural integrity of brain white matter tracts supporting language and emergent literacy skills. [Hutton, 2022.](#)

Screen media activity related maturational coupling or structural correlation networks in the brain, provides evidence that individual differences of these networks have mixed consequences for psychopathology and cognitive performance. [Paulus, 2019.](#)

[Sleep disorders](#)

Longitudinal survey of 3,000 adolescents aged 11 to 14 collected before and during the early months of the COVID-19 pandemic in 2020 found that supportive relationships with family and friends, as well as healthy behaviours such as physical activity and better sleep, appeared to protect adolescents' mental health from the pandemic's harmful effects. [National Institutes of Health – News Releases. Jan. 24, 2022.](#)

Children's sleep and behaviors have been negatively associated with usage of technology. [Almuaigel, 2021.](#)

Greater heart rate differences between restless sleep phases and restful sleep indicated poorer nighttime recovery in children with more frequent use of touchscreen media. [Hackl-Wimmer, 2021.](#)

Exposure to electronic screen-based media was negatively associated with nighttime sleep (but not daytime sleep), such that an hour of screen time was associated with nearly 13 min less sleep on a typical night. [Ribner, 2019.](#)

Literature review found a link between screen media use and delayed bedtime and/or decreased total sleep time; there is a need to educate and motivate doctors, teachers, parents, and adolescents themselves to develop healthy sleeping habits. [Hale, 2018.](#)

Access to and use of a multimedia device at bedtime were significantly associated with the following factors: insufficient sleep, poor sleep quality, and excessive daytime sleepiness. [Carter, 2016.](#)

Children today have unprecedented access to technology and media, which is no longer limited to waking hours now that mobile devices have entered the bedroom. [Czeisler, 2016.](#)

In 90% of research, screen use is linked to poor sleep effects (mainly reduced length and delayed timing). [Hale, 2015.](#)

Smartphone use was associated with later bedtime and increased bedtime use. The use of electronic media was negatively associated with sleep duration, difficulty falling asleep and, as a result, depressive symptoms. [Sakari, 2015.](#)

30% of children consumed a caffeinated drink every day, reducing total sleep by 15 minutes a day, and 42% used a TV in the bedroom, reducing overall sleep by 45 minutes per night. [Calamaro, 2011.](#)

Sleep disturbances and sleep/wake transition disorders are caused by passive and active television viewing. [Paavonen, 2006.](#)

Myopia and vision impairment

Prolonged exposure to high levels of blue light pose a significant hazards to the visual system resulting in damage to the retina with associated remodeling of visual cortex neurons. [Theruveethi, 2022.](#)

During the pandemic, children between the ages of 6 and 8 spent significantly less time outdoors and much more time in front of a screen than before the pandemic, resulting in a 60% increase in myopia. [Kuehn, 2021.](#)

Increased time spent outdoors can delay the development of myopia. In terms of gender, girls should be targeted to more effectively prevent and control the development and progression of myopia. [Zhang, 2020.](#)

In just one session, exposure to the realistic yet caricatured scene data of digital screen media might change visual contour perception. [Hipp, 2020.](#)

Study findings show blue light found in digital displays induces DNA double strand breaks in retinal neurons and the damage is more pronounced compared to glia cells. [Chen, 2019.](#)

Blue light causes dry eye, cataract, age-related macular degeneration, inhibit melatonin, enhances adrenocortical hormone production and impairs sleep. [Zhao, 2018.](#)

The study investigated mechanisms of photoexcited retinal intercepting signaling networks in living cells. Retinal absorbs blue light and causes translocation of Phosphatidylinositol 4,5-bisphosphate sensor to the cytosol. [Ratnayake, 2018.](#)

Blue light resulted in production of reactive oxygen species, mitochondrial damage, DNA damage and apoptosis (cell death). [Chamorro, 2013.](#)

Myopia is irreversible and increasing the amount of time outdoors can be a simple strategy that can reduce the risk of developing it and reducing its progression. [Sherwin, 2012.](#)

The vast majority of children and adolescents with a history of video game seizures are photosensitive and should be tested with standardized photic stimulation. [Kasteleijn-Nolst Trenité, 2002.](#)

The most frequent type of epilepsy is reflex epilepsy, in which seizures are triggered by specific environmental events; the most popular precipitants are a television or a computer screen. [Singh, 2001.](#)

Cardiovascular effects

Acute myocardial infarction associated mortality increased by 5.3% in the youngest (25-44) and 3.4% in the middle-aged groups between prepandemic and pandemic periods. [Yeo, 2022](#).

Stronger blood volume pulse and respiratory responses, as well as weaker peripheral temperature reactions in individuals at high risk of Internet Addiction, indicate a heavy activation of the sympathetic nervous system in these people. [Lu, 2010](#).

Posture, breathing, headaches, eating disorders

Single case of headache from using digital device resolved with deep breath and posture reset exercise. [Peper, 2021](#).

DE (disordered eating) behaviors were reported by 51.7% of girls and 45.0% of boys, with strict exercise and meal skipping the most common. A total of 75.4% of girls and 69.9% of boys had at least one SM account where Instagram was the most common, used by 68.1% of girls and 61.7% of boys. A clear pattern of association was found between SM usage and DE cognitions and behaviors with this exploratory study confirming that these relationships occur at younger-age than previously investigated. [Wilksch 2020](#).

A study found that using a smartphone for more than 4 hours a day can have a negative impact on posture and lung function. [Jung, 2016](#).

The forces on the cervical spine increase gradually as the neck is in forward flexion, as is often the case with the use of smartphones. [Hansraj, 2014](#).

Postures utilized while holding mobile devices such as holding a phone vs texting are believed to impact muscle and thumb positions [\(Gustafsson, Johnson & Hagberg, 2010\)](#).

When texting, female exhibit higher muscle activity in the extensor digitorum and the abductor pollicis longus; also having greater thumb abduction and fewer pauses in thumb movements [\(Gustafsson, Johnson & Hagberg, 2010\)](#).

Social

Social relationships

Social technology use has become the predominant communication method among adolescents and the preferred method of communication when compared to face-to-face interactions [\(Hoge, Bickham, & Cantor, 2017\)](#).

13-year-olds value their online social contacts at least as much as, if not more than, some of their in-person relationships. [Underwood, 2015](#).

During a restaurant dinner, 40 out of 55 parents were observed using their cellphones, and more absorbed parents reacted more harshly to child behaviour. [Radesky, 2014](#).

Lower video game playing time was linked with higher life satisfaction and prosocial engagement. [Przybylski, 2014](#).

Study discovered evidence of a connection between self-esteem and internet addiction among females, as well as a mediation function for a preference for online social engagement. [Fioravanti, 2012](#).

Adolescents reported more conflict when parents called for activity monitoring, school assignments, and when they were upset; calls seeking support are positively associated with adolescent self-esteem, while calls from upset

parents are negatively associated. [Weisskirch, 2011.](#)

Communication quality in intimate relationships is significantly better in the Second-Life relationships than in 3D life and the levels of satisfaction is higher with virtual partners. [Gilbert, 2011.](#)

Teens are embracing text messaging as the core of their communication method with peers, and this pattern is growing. [Lenhart, 2010.](#)

Teenagers' awareness of nonverbal emotional cues improved dramatically after five days of face-to-face conversation without the use of any screen-based media; less screen time and more social interaction enhances teenager's understanding of nonverbal emotional signals. [Uhls, 2014.](#)

Social media

Youth showed insight about negative impacts of social media and were especially concerned about safety on social media. Youth were more likely to report wanting to change the amount of time spent on their social media compared to the content they view. [Harness, 2022.](#)

Facebook's own in-depth study reveals a major teen mental-health concern that it downplays in public. [Wells, 2021.](#)

Females who were exposed to thin-ideal images had greater body and facial dissatisfaction than female who were exposed to average images. [Tiqqemann, 2018.](#)

Young people's perspectives on social media and relationships, both for themselves and for other young people who have suffered various forms of social marginalization, were gathered through semi-structured interviews. [Regan, 2017.](#)

Twitter usage leads to increased Twitter-related disagreements between intimate partners, which leads to infidelity, breakup, and divorce. [Clayton, 2014.](#)

A high amount of Facebook usage has been linked to poor relationship results. [Clayton, 2013.](#)

A significant number of students have problems related to their usage of the Internet, and Facebook may contribute to the severity of their symptoms. [Kittinger, 2012.](#)

The time spent using social media was not associated with larger offline networks or feeling emotionally closer to offline network members. [Pollet, 2011.](#)

Video games

Gaming disorder is characterized by impaired control over gaming, increasing priority given to gaming over other activities to the extent that gaming takes precedence over other interests and daily activities, and continuation or escalation of gaming despite the occurrence of negative consequences. [\(WHO, 2022\)](#)

Research has demonstrated that Video Game Disorders in adolescents may lead to adverse behavioural, affective and cognitive outcomes [\(Rojas-Jara et al., 2022\).](#)

Predictive factors or factors that may increase risk of disorder development include genetic predisposition to/development of various psychological disorders, school commitment, parental supervision, involvement in extracurricular activities and sibling/social engagement [\(Rojas-Jara et al., 2022\).](#)

A potential correlational relationship exists between gaming disorder and an increase in difficulty with psychosocial relationships, social skills deficits, and increased prevalence of low self-esteem and mental health related illness in adolescents ([Rojas-Jara et al., 2022](#)).

Adolescents are aware of changes relating to excessive video game use such as changes in personality, mood, diet, sleep habits, and behaviour; but do not view them as problematic ([Rasmussen et al., 2014](#); [Seok et al., 2018](#)).

Risky game users reported lower levels of happiness and satisfaction, as well as a significantly higher lifetime prevalence of major depressive disorder, alcohol dependence, and suicidal ideation; usual game players had a significantly higher lifetime prevalence of alcohol dependence and suicidal ideation. ([Byeon, 2022](#)).

Discussion regarding major challenges for the existing research, namely, the lack of precise definitions of video gaming, the lack of distinct choice of cognitive ability under study, and the lack of standardized study protocols. Less research exists on neural changes in addition to cognitive changes due to video gaming. Existing studies reveal evidence for the involvement of similar brain regions in functional and structural changes. There seems to be a predominance in the hippocampal, prefrontal, and parietal brain regions; however, studies differ immensely, which makes a meta-analytic interpretation vulnerable. ([Kuhn 2019](#)).

The majority (93.7 percent) of the members of the Royal Australia and New Zealand College of Psychiatrists were familiar with the principles of IGD/PIU; the majority (78.86 percent) also believed it was possible to be 'addicted' to non-gaming internet content, and 76.12 percent said non-gaming addictions could be added to the classification systems. ([Dullur, 2017](#)).

More than two-thirds of individuals who played games did not report any symptoms of Internet gaming problem, and studies revealed that a very tiny fraction of the general population may qualify for a potential acute diagnosis of Internet gaming disorder. ([Przybylski, 2016](#)).

Intensive video game playing, can cause elements from the game world evoke thoughts and imagery outside the game world, influencing the perception and interpretation of stimuli in everyday life. ([Poels, 2014](#)).

Playing games with a prosocial, nonviolent, or problem-solving theme is likely to teach attitudes and encourage behaviours that are congruent with civic engagement, whereas playing games with a violent, immediate solution to conflicts of interest is likely to teach attitudes and encourage behaviours that are incongruent with civic engagement; parents who participate in their children's gaming activities may be able to mitigate the negative impacts of violent games. ([Anderson, 2014](#)).

Overreactions, avoidances, and involuntary limb movements were all reported by many gamers in response to real-life stimuli as if they were still playing videogames. ([Ortiz de Gortari, 2014](#)).

The realistic controller and large screen elicited higher hostility, presence, and excitement when playing violent video games than a standard mouse and small screen, respectively. ([Kim, 2013](#)).

Being exposed to violent online games was linked to being both a perpetrator and a victim of cyberbullying. ([Lam, 2013](#)).

The results showed a small to moderate effect between playing violent video games and lowered empathic concern and pro-social behavior among young adults. ([Fraser, 2012](#)).

After controlling for previous levels of aggressiveness, more violent video game play predicted higher levels of

violence over time. [Willoughby, 2012.](#)

Prosocial games reduce state hostility and increase positive state affect in college students while violent video games have the opposite effect. [Saleem, 2012.](#)

Greater amounts of gaming, lower social competence, and greater impulsivity seemed to act as risk factors for becoming pathological gamers, whereas depression, anxiety, social phobias, and lower school performance seemed to act as outcomes of pathological gaming. [Gentile 2011.](#)

Cue-induced activation to internet video game stimuli may be similar to that seen in people with substance abuse or pathological gambling during cue presentation. [Han, 2011.](#)

When comparing regular and infrequent video game players, the study found that frequent gamers had a greater left striatal grey matter volume. [Kühn, 2011.](#)

Many video game players have encountered the Game Transfer Phenomena, in which they appear to incorporate video game components into their everyday lives. [Ortiz de Gortari, 2011.](#)

Social activities with parents are negatively associated with gaming addiction, although no association has been found between gaming with parents and gaming addiction. [Jeong, 2011.](#)

The purpose of this article is to study video game usage trends with a focus on gender disparities, as well as to design a video game addiction questionnaire. [Choliz, 2011.](#)

Violent video games increase aggressive behaviour and decrease prosocial behaviour, however relaxing video games have the opposite effects. [Whitaker & Bushman, 2011.](#)

Playing video games during adolescence predicted later risky driving behaviour by the attitudes and intentions of youths to display such behavior in the future. [Beullens, 2010.](#)

Violent video game exposure leads to an increase in aggressive attitude, aggressive cognition, and aggressive affect, as well as a decrease in empathy and prosocial behaviour. [Anderson, 2010.](#)

Playing violent video games is a significant risk factor for later physically aggressive behavior, therefore reducing the exposure of youth to this risk factor is very important. [Anderson, 2008.](#)

Participants who had previously played a violent video game demonstrated a physiological desensitization to violence by having a lower heart rate and galvanic skin response when viewing filmed real violence. [Carnagey, 2007.](#)

In both the short and long term, viewing media violence increases the likelihood that a viewer or videogame player will act aggressively. [Huesmann, 2007.](#)

Family conflicts are reflected in children's interest in violent media, which has a positive association with violent use of electronic media. [Vandewater, 2005.](#)

Adolescents who were exposed to more violent video games were more aggressive, reported getting into more confrontations with teachers, were more likely to be involved in physical fights, and performed worse in school. [Gentile, 2004.](#)

Pornography

Survey by Common Sense Media reports 3 out of 4 children view porn prior to 13 years of age. 52% of children and youth have viewed violent porn (people get hurt). [Teens and Porn, 2022.](#)

According to a new report by the National Council for Missing and Exploited Children (NCMEC), Facebook reported over 20 million child sexual abuse photos to its platform in 2020. [Porter, 2021.](#)

Findings from 2020 quantitative research among 9–17 year old's states that 1 in 7 children aged 9-12 years shared their own nude photos in 2020, triple the number from 2019. [Torn, 2021.](#)

During the Covid-19 pandemic, Pornhub, one of the largest porn sites, saw porn use spike in many countries, with global traffic gaining more than 11%. [Mestre-Bach, 2020.](#)

Distributors of child sexual abuse material are becoming bolder, using major platforms to attract audiences. [Solon, 2020.](#)

A charity found that sex criminals nurture children on Instagram more than on any other online platform. [BBC News, 2019.](#)

Teenagers spam Instagram to combat the apparent web of child pornography. [Lorenz, 2019.](#)

A collection of research and reviews that show similarities between obsessive sexual behaviour and the addiction paradigm. [IITAP, 2017.](#)

Survey of 1565 grade 12 students showed 77.9% use porn, and of these, 8% use daily, 59% perceive porn as always stimulating, 21.9% define it as habitual, 10% report that it reduces sexual interest towards potential real-life partners, 9.1% report addiction and 19% report an abnormal sexual response. [Pizzol 2016.](#)

Long-term internet pornography use resulted in erectile dysfunction and delayed ejaculation. [Park, 2016.](#)

135 studies were reviewed testing effects of media sexualization between 1995 and 2015 finding exposure to this content is associated with higher levels of body dissatisfaction, self-objectification, support of sexist and adversarial beliefs, and tolerance of sexual violence toward women. Experimental exposure to this content leads both women and men to have a diminished view of women's competence, morality, and humanity. [Ward, 2016.](#)

Meta-analysis showed porn consumption was associated with sexual aggression in cross-sectional and longitudinal studies. Associations were stronger for verbal than physical sexual aggression. The general pattern of results suggested that violent content may be an exacerbating factor. [Wright 2015.](#)

Internet gaming disorder is associated with pornography use. [Voss 2015.](#)

Brain scans of 64 male adults found a significant negative association between reported pornography hours per week and **gray matter volume** in the right caudate as well as **functional activity** during a sexual cue-reactivity paradigm in the left putamen. **Functional connectivity** of the right caudate to the left dorsolateral prefrontal cortex was also negatively associated with hours of pornography consumption. [Kuhn 2014.](#)

Sexting/Sextortion

Hypersexual disorder is defined as a disorder relating to the lack of impulse control expressed in sexual behaviours which fails to properly classify it as a legitimate sexual disorder [\(Reed et al., 2022\).](#)

The ICD-11 classifies compulsive sexual behaviour disorder within the list of impulse control disorders [\(Reed et al., 2022\).](#)

Sextortion is defined as "... the threatened dissemination of explicit, intimate, or embarrassing images of a sexual nature without consent, usually for the purpose of procuring additional images, sexual acts, money, or something else," ([Patchin & Hinduja, 2020](#)).

Sextortion tactics may take place in a variety of ways including: stalking or harassing, being contacted online or via phone, victim impersonation via creating fake accounts or via posting publicly or privately sharing sexual images of the victim online without permission ([Patchin & Hinduja, 2020](#)).

Victims of sextortion are more commonly targeted by individuals whom they share an existing friendship (romantic or otherwise). Males are more likely to have assumed the role as participant and victim of sextortion ([Patchin & Hinduja, 2020](#)).

Often youth who use sextortion or sexually harass other youth online have been victims themselves ([Patchin & Hinduja, 2020](#)).

Males and non-heterosexual youth are more likely to be the target of sextortion and online sexual harassment related incidences ([Patchin & Hinduja, 2020](#)).

While few victims of sextortion disclose the severity of their experience(s) to their parents, authorities or adults, adolescent females are significantly more likely to seek out assistance than males ([Patchin & Hinduja, 2020](#)).

Sexting is believed to be a form of victimization whereby a correlational relationship exists between mental health or psychological health. A bi-directional relationship is believed to exist between sexting, the sharing of sexual images and depression-like symptoms ([Gassó et al., 2019](#)).

Victims of sexting are more likely to endure cyberbullying, online dating violence, or revenge porn ([Gassó et al., 2019](#)).

Parents, educators, and the health care community need to gain a deeper understanding the negative impacts sexting may have in order to develop appropriate educational material and prevention plans in place ([Gassó et al., 2019](#)).

Changes in the frontal lobe, amygdala, hippocampus, hypothalamus, septum, and reward-processing brain areas all play a part in the development of hypersexuality. ([Kühn, 2016](#)).

Girls who post provocative photos choose to submit to sexual stereotypes in order to be socially accepted by their peers. ([Mascheroni, 2015](#)).

Due to barriers, gender related stigmas, and socially constructed gender roles males are less likely to seek out support relating to sexual abuse/harassment; often believing limited support is available ([Allen, Ridgeway & Swan, 2015](#)).

More frequent viewing of pornography is associated with a higher incidence of hooking up, a higher number of unique hook up partners, having had more previous sexual partners of all types, more one occasion sexual partners, plans to have a higher number of sexual partners in the future, and more permissive sexual scripts. ([Braithwaite, 2014](#)).

20% of students admitted sending a naked or semi-naked picture or video or text message of a sexual nature - any of which were classified as "sext" - and over 30% reported receiving a sext. ([Fleschler Peskin, 2013](#)).

According to studies, 25% of ten-year-old children sext, 40% of teen girls have uploaded or sent sexually explicit photographs, and 80% of youths under the age of 18 have sexted. Sending a nude photo of oneself was classified as being sexted. ([Englander, 2012](#)).

Desensitization and tolerance are consequences of porn addiction, which requires a higher level of stimuli to satisfy

cravings, such as prostitution and sexual depravity. [Klein, 2009](#).

Researchers report that 42% of children aged 10-17 are actively using pornography, with an average first exposure age of 6 years. [Wolak, 2007](#).

Children using pornography are significantly more likely to report criminal behaviour and substance use in the previous year, as well as depression and a lower emotional connection with the caregiver. [Ybarra, 2005](#).

Males are less likely to report certain types of victimization including sextortion, sexual assault and abuse than females [\(Davies, 2002\)](#).

Data privacy and security

Government officials such as Governor Newsom of California have passed legislation such as bill AB 2273 “...aimed at protecting the wellbeing, data, and privacy of children using online platforms” [\(Office of Governor, Gavin Newsom, 2022\)](#).

Bill AB 2273 emphasizes child privacy rights and mandates that “... privacy information, terms of service, policies, and community standards be easily accessible and upheld,” [\(Office of Governor, Gavin Newsom, 2022\)](#).

Francis Haugen exposed condemning evidence that Facebook’s (now Meta’s) platforms including Instagram and What’s App knowingly caused harm to children by ignoring mental health problems caused by it’s photo sharing function and allowing its algorithm to incentivize ugly and hostile content. [Kusisto, 2021](#).

Apps used by young children had a high frequency of repeated transmissions of identifiers to third parties, suggesting federal privacy laws are not being enforced. [Zhao, 2020](#).

A technical error detected on Facebook allowed children to join chat groups with unauthorized users. [Brandom, The Verge, 2019](#).

Emotional

9.3 percent of respondents said that using the Internet has had at least one negative functional effect, including the neglect of recreational activities and issues with family/partner, work or school, and health. Problematic internet use was linked to increasing depersonalization, avoidance of negative feelings, preference for certain applications (gaming, gambling, online sex), and a longer average daily time spent online. [Beutel, 2011](#).

Independence and self-regulation

Frequent use of mobile devices for calming young children resulted in higher emotional reactivity and displacement of opportunities for learning emotion-regulation strategies over time; pediatric health care professionals may wish to encourage alternate calming approaches. [Radesky 2023](#).

Background TV and screen time in general is negatively related to children’s self-regulation; watching fantastical content seems to have immediate negative effects on children’s self-regulatory skills. [Uzundag, 2022](#).

Higher levels of media emotion regulation in toddlers was associated with more problematic media use. Extreme emotions arose when the media was taken from the toddlers. [Coyne, 2021](#).

Growing evidence suggests that diagnosing *Oppositional Defiant Disorder* may cause inadvertent harm by exacerbating stigma associated with reactive behaviour and allowing normative reactions to trauma to be mischaracterized as issues of

self-control. [Beltrán, 2021](#).

Negative feelings offline (primarily boredom and a lack of self-control) are related to problematic Internet use, as is too little time spent cultivating hobbies and interests. [Tomczyk, 2019](#).

Talking out of turn was shown to be the most common and disruptive issue behaviour, followed by non-attentiveness, daydreaming, and inactivity. [Sun, 2012](#).

Resilience and risk

Peter Gray in 2015 reported the following trends in college students: needier and less resilient, increasingly afraid to fail, failure was perceived as catastrophic and unacceptable, need to be certain about things, don't take risks, complain about trivial matters, complaints demand quick remediation. [Gray, 2015](#).

Schools without rules result in improved concentration, grades, 'in-seat' time, less need for movement breaks, less problematic behaviours, improved confidence, less bullying, less injuries. [Schofield, 2014](#).

Adolescents who reported the highest amount of screen time, particularly the computer time, were significantly more likely to participate in risky behaviors. [Carson, 2011](#).

Aggression and violence

Meta-analyses found that violent video game consumption increases aggression and decreases prosocial behavior, whereas prosocial video games have the opposite effects. Whether video games have a negative or positive influence on others depends heavily on their content [\(Greitemeyer 2022\)](#).

Sexual assault related emergency department visits increased by 1533% between 2006-2019 [\(Vogt et al., 2022\)](#).

Data collected from 2006-2019 demonstrate an increase in sexual assault emergency department visits [\(Vogt et al., 2022\)](#).

Increases in FBI-reported rape and sexual assault cases between 2015-2019 may be linked to the presence of resources and campaigns such as the #MeToo movement and the Larry Nassar/USA Gymnastics case [\(Vogt et al., 2022\)](#).

Canada's Assaulted Women's Helpline received 60% more calls between Oct. 1 and Dec. 31, 2020, compared to the same period the previous year - said Yvonne Harding, manager of resource development at the organization. [Thompson, CBC News, 2021](#).

Study 1 surveyed rant-site visitors and found that while they become relaxed immediately after posting, they also experience more anger than most and express their anger in maladaptive ways. Study 2 explored the emotional impact of reading and writing rants and found that reading and writing rants were associated with negative shifts in mood [Martin, 2013](#).

Viewing inappropriate media content by low-income preschoolers was associated with higher scores for hyperactivity and aggression, and lower ratings for social skills while the amount of viewing was not in line with those in the classroom. [Conners-Burrow, 2011](#).

Research results revealed a positive relationship between exposure to profanity in various forms of media and beliefs about profanity, the use of profanity, and involvement in physical and relational aggression. [Coyne, 2011](#).

Preschool boys who see violent programs are more likely to act aggressively later in life. [Christakis, 2007](#).

Studies regarding the effects of violent video games on children found even violent cartoons increase aggression in 9-12-year-old children. [Anderson C, 2007.](#)

Excessive television viewing of violence can lead to a significant number of aggressive scripts being stored in long-term memory in the posterior cingulate gyrus, making it easier to recall violent events that act as a cue for overt social behaviour. [Murray, 2006.](#)

Media violence can increase aggression by priming aggressive thoughts and decision processes increasing physiological arousal and triggering a tendency to imitate observed behaviors. [Anderson, 2003.](#)

Longitudinal 22-year study ages 8-19 years shows childhood exposure to media violence predicts young adult aggressive behavior for both males and females. Identification with aggressive TV characters and perceived realism of TV violence also predict later aggression. These relations persist even when the effects of socioeconomic status, intellectual ability, and a variety of parenting factors are controlled. [Huesmann, 2003.](#)

Cyberbullying

The cyberbully-victim group has the highest levels of depressive symptoms, as well as the lowest levels of subjective well-being and family support, according to a study of 1707 10-13 year old. [Hellfeldt, 2020.](#)

Fifty-nine percent of US teens have reported being bullied on social media. [Anderson, PEW Research Center, 2018.](#)

Instagram harassment can be extremely brutal, and many feel there is no escape from it. [Lorenz, 2018.](#)

An overlap and correlational relationship appears to exist between youth who bully online and offline [\(Hoge, Bickham, & Cantor, 2017\).](#)

Adolescents who have fallen victim to cyberbullying report experiencing negative emotional responses/feelings including embarrassment, worry, fear, depression, or loneliness afterward. Adolescents' victims of cyber bullying are more likely to experience negative mental and physical health outcomes including suicidal and self-harming thoughts [\(Hoge, Bickham, & Cantor, 2017\).](#)

While internet and internet accessibility use can lead to increased risk of cyberbullying and negative outcomes, online support groups and access to therapeutic health resources can be beneficial [\(Hoge, Bickham, & Cantor, 2017\).](#)

The frequency of internet use, cyberbullying, and browsing pornographic websites was linked to a number of physical and psychological health issues. [Mitra, 2017.](#)

"Bullying Today" provides practical, precise information to help school employees cope with bullying in the classroom and online. [Patchin, 2016.](#)

The Intel Security Digital Safety Program will give educators with standards-aligned tools, such as self-paced lessons for use in the classroom, to help students interact with timely, relevant topics such as Internet safety and security. [Hillman, Intel Security Digital Safety Program, 2014.](#)

Peer victimization has been found to be associated with both suicidal thoughts and suicide attempts among children and adolescents. [van Geel, 2014.](#)

Internalizing, externalizing, and drug misuse problems in teenagers are linked to cyberbullying; family dinners are beneficial to adolescent mental health and may help adolescents avoid the detrimental consequences of

cyberbullying. [Elgar, 2014.](#)

Cyberbullying is considered as a harmful and severe component of young people's life and online interactions, although it is relatively common. [Bryce, 2013.](#)

Cyberbullies had lower empathy responsiveness and were more fearful of being victims of cyberbullying than non-cyberbullies. [Steffgen, 2011.](#)

According to research, cyberbullying victims are nearly twice as likely to attempt suicide as children who have never been cyberbullied. [Hinduja, 2010.](#)

Youth who had been harassed online in the previous 30 days were eight times more likely to bring a weapon to school. [Ybarra, 2007.](#)

Online bullying is linked to school behaviour issues, and media literacy programs can help young people cope with the harmful effects of electronic media. [Worthen, 2007.](#)

While cyberbullying takes place off-campus, resulting altercations happen on site. [Willard, 2007.](#)

In a survey of 3,767 students in grades 6, 7, and 8 from six schools in the United States, 11 percent said they had been bullied electronically in the previous month, and 4% said they had bullied a victim. [Kowalski, 2007.](#)

Hate crimes

In Canada, police reported 1,946 hate-motivated criminal events in 2019; from 2010 to 2019, 23 percent of people accused of hate crimes were between the ages of 12 and 17, and 86 per cent were male. [Statistics Canada, Moreau, 2021.](#)

“Incels - short for Involuntary Celibate – a community of males who hold misogynistic beliefs, and often launch violent attacks against women or minority groups.” [\(Center for Countering Digital Hate, 2022\).](#)

A 59% increase in codewords used and terms relating to mass violence online has been observed within the Incel forum which is a pathway into the Incelosphere. One in five Incel forum posts includes misogynistic, racist, antisemitic, or anti-LGBTQ+ language. Mainstream social media platforms like YouTube and Google are enabling pathways to the Incelosphere [\(Center for Countering Digital Hate, 2022\).](#)

Incel forum posts mention of rape every 29 minutes with 9 in 10 of posters in relevant discussions were supportive of sexual violence against women [\(Center for Countering Digital Hate, 2022\).](#)

Forums such as those within the Incelosphere are known to encourage hate speech and violent ideologies which are believed to be linked to violent acts primarily directed towards females and/or racial/gender minorities [\(Center for Countering Digital Hate, 2022\).](#)

Artificial Intelligence (AI) and Radicalization

Robotic methods of learning and education often perpetuate negative stereotypes, which yield harmful outcomes which should until proven safe and effective, be reprogrammed, halted, or paused [\(Hundt et al., 2022\).](#)

Robot powered by larger datasets and dissolution models often display negative stereotypes directed towards gender, race and scientifically- discredited physiognomy [\(Hundt et al., 2022\).](#)

AI systems powered by larger datasets and dissolution models audited methods are less likely to acknowledge women and people of colour ([Hundt et al., 2022](#)).

Social media is highly associated with the recruitment of and conversion phases of radicalization; with converts being more vulnerable to online radicalization than alternate methods ([Bastug, Douai, & Akca, 2020](#)). Gaming consoles and the presence of such devices in the bedroom may result in reduced social development in children ([Fu et al., 2017](#)).

Content on online platforms such as YouTube may contain radical ideologies and such platforms may be used to recruit converts and carry-out radicalising agendas ([Birmingham et al., 2009](#)).

Mental

Mental health

Concerns are growing about the referral of children and adolescents with mental health conditions to emergency departments. ([Hoge, 2022](#)).

Study found that adolescents who spent less than one hour per day on screens were not negatively affected by it, but higher amounts were positively associated with increased incidence of mental illness. ([Khan, 2021](#)).

Problematic Internet Use was associated with depressive disorders, combined presentation of ADHD, Autism Spectrum Disorder, higher levels of impairment, and increased sleep disturbances, even when considering demographic covariates and psychiatric comorbidity. ([Restrepo, 2020](#)).

Over the last decade, the number of young adults with mental health problems has risen dramatically. ([APA, 2019](#)).

Light digital media users reported significantly higher psychological well-being than intensive users. ([Twenge, 2019](#)).

Internet activities and psychiatric diagnoses related to problematic Internet use vary with age, with implications for public health, e.g. younger children may have a diagnosis of autism or ADHD, while adolescents may have obsessive-compulsive disorder or anxiety. ([Ioannidis, 2018](#)).

Physically, Post-Millennials are safer than any previous generation of teens, but they are on the verge of a mental-health crisis. ([Twenge, 2017](#)).

Selective school-based alcohol prevention programs aimed at youth with personality risk factors for addiction and mental health problems have been shown to reduce substance use and misuse in those with high personality profiles. ([Conrod, 2013](#)).

The concept that DSM disorders are distinct diseases with unique pathophysiology has been discredited; no physiological, genetic, or phenotypic specificity has been proven for the various DSM-5 disorders. ([Ross, 2013](#)).

Mental health prevention programs can help to minimize the prevalence of mental illnesses in children. ([Waddell, 2007](#)).

Current non-pharmacological approaches to stopping disturbed or aggressive behavior are not supported by evidence from controlled studies; clinical practice is based on evidence that is not derived from studies, and continuous practice entirely outside of well-designed, conducted, and reported randomized studies is difficult to substantiate. ([Muralidharan, 2006](#)).

As pharmaceutical firms' infiltration of the educational system grows, teachers have taken on the role of "disease

spotters" and "sickness brokers" for ADHD. [Phillips CB, 2006.](#)

Anxiety, depression, suicide

Prospective cohort study shows suicide is the leading cause of death among adolescents. Each additional hour of total screen time (texting, videos, videogames, social media) was associated with 1.09 higher odd of suicidal behaviors at 2-year follow up. [Chu, 2023.](#)

The younger children get cell phones or tablets, the worse their mental health will be as adults. [Sapien Labs Report 2023.](#)

57% of teen girls say they experience persistent sadness or hopelessness (up from 36% in 2011) and 30% of teen girls say they have seriously considered suicide (up from 19% in 2011). [Youth Risk Behavior Survey - Center for Disease Control Feb. 2022.](#)

The mean total daily screen use doubled from pre-pandemic estimates from the same cohort at baseline, according to a review of data from 5412 adolescents predominantly aged 12 to 13 years. [Nagata, 2022.](#)

During the pandemic, at-home exercise is a powerful behaviour for improving mental health in adults, especially in individuals with elevated levels of depressive symptoms. [Puterman, 2021.](#)

Visits to the emergency room for all mental health issues climbed by 60%, while visits for intentional self-harm soared by 329 percent. Children with substance use disorders saw a 159 percent increase in visits, whereas alcohol-related problems saw a 39 percent decrease. [Lo, 2021.](#)

Reduced in-person interactions among children, friends, social supports, and professionals such as teachers, school counsellors, pediatricians, and child welfare workers are among the effects of social media on youth during the pandemic, making it harder to recognize signs of child abuse, mental health concerns, and other challenges. [U.S. Surgeon General's Advisory, 2021.](#)

There are many specific types of risk factors associated with suicidal behavior in adolescents. [Sumner, 2021.](#)

Suicidal games are a prevalent and hard-to-manage cyber threat [\(Kobilke & Markiewitz, 2021\).](#)

Social media has the potential to elicit imitation suicides in adolescents, whom use it as a means of involvement and identification with role models which are two factors believed to be correlational related with increased risk of imitation suicide when harmful messages or instructions are given by media role models [\(Kobilke & Markiewitz, 2021\).](#)

Media content should be reviewed more regularly for specific terms, names, cues, and depictions of harmful and suicidal content used in prior suicidal games [\(Kobilke & Markiewitz, 2021\).](#)

Approximately 30% of videos relating to the Momo Challenge are visible without safety warning; with 5% of the videos offering visual or auditory depiction of the challenge [\(Kobilke & Markiewitz, 2021\).](#)

Adults who reported more positive childhood experiences had a lower risk of depression and/or poor mental health. [Bethell, 2019.](#)

Schools are struggling with the problem of student depression as data indicates that the situation is worsening. [Blad, 2019.](#)

For every increased hour spent on social media, teens showed an increase in depression symptoms by 0.64 units. [Boers, 2019.](#)

Between 2010 and 2015, mental health issues were more frequently reported by adolescents who spent more time in new media than their peers who spent more time in non-screen activities. [Twenge, 2018.](#)

A growing body of studies shows a link between digital media and depression. [Hoge, 2017.](#)

Depression and anxiety are independent positive predictors of smartphone addiction. [Matar, 2017.](#)

Adolescents may seek digital distraction from emerging anxiety or distress emotions, creating a reinforced behavioral avoidance of emotional experiences [\(Hoge, Bickham, & Cantor, 2017\).](#)

Interruptions that delay day-to-day technology use are associated with increased anxiety and stress symptoms among adolescents [\(Hoge, Bickham, & Cantor, 2017\).](#)

Playing more games is linked to a higher risk of depression; adolescent depression is influenced by a variety of factors at the individual level (e.g., gender, health, and family background), as well as living in a community with more divorced families. [Kim, 2016.](#)

Teens who use social media sites for at least two hours a day are much more likely to suffer from mental illness, psychological distress and suicidal thoughts. [Sampasa-Kanyinga, 2015.](#)

National research reports that problematic use of video games was associated with lower life satisfaction scores and increased levels of anxiety and depression. [Mentzoni, 2011.](#)

Parents who keep contact with their university-aged children via social networks (SMS, e-mail, Facebook), have more anxious, lonely children, who show loneliness, anxious attachment, and conflict in the parental relationship, than children whose parents are in contact by phone. [Gentzler, 2011.](#)

Short sleep duration may play a part in depression's etiology. By prolonging sleep duration, earlier parentally established bedtimes may protect against adolescent depression and suicide ideation. [Gangwisch, 2010.](#)

Visit rates to Emergency Departments (Eds) significantly increased between 1997 and 2007, and EDs are increasingly serving as a safety net for medically underserved patients. [Tang, 2010.](#)

Depictions or discussion of suicide in the media may also lead to positive outcomes when discussed in the context of prevention, education, improved access to and relating to services available; encouraging vulnerable populations to seek support, overcome and participate in coping strategies [\(Niederkröthaler et al., 2010\).](#)

Television and overall media exposure throughout adolescence are linked to an increased risk of developing depressive symptoms in young adulthood, particularly among young males. [Primack, 2009.](#)

People who report they are unhappy watch about 30% more television per day than those who report they are happy. [Robinson JP, 2008.](#)

Autism

Children's screen viewing decreased from an average of 5.6 h/day prior to intervention to 5 min/day during the study. Significant improvements were observed in core autism symptoms and parental stress from pre- to post-intervention. [Heffler 2022.](#)

Longer screen time in boys at 1 year of age was significantly associated with ASD at 3 years of age. [Kushima, 2022.](#)

According to new data, one in every 44, 8-year-old children in the United States has been diagnosed with autism.

[Verbanas, 2021.](#)

Virtual Autism is a new disorder that impacts babies and toddlers who spend long periods of time in front of screens.

[The Durable Human, 2021.](#)

Excessive screen time is detrimental to children's socio-emotional, attention and cognitive functions, and can cause behavioral symptoms of autism. The authors recommend screen cessation for all children with neurodevelopmental delays. [Dieu-Osika, 2020.](#)

Early in life, more screen time and less caregiver-child interaction are linked to later autism spectrum disorder -like symptoms. [Heffler, 2020.](#)

First published autism extinction case with screen discontinuation. [Numata-Uematsu, 2018.](#)

Children with ASD who had an anamnesis history of excessive virtual environment consumption between the ages of 0 and 3 years old had a 37 percent increase in QD/IQ between the first and second complex psychological evaluations, while resources used were three times lower than in the control group. [Teodor Zamfir, 2018.](#)

Male individuals with ASD seem to have more hypersexual and paraphilic fantasies and behaviors than males in the general population. [Schottle 2017.](#)

Study included 8900 children aged 3-6 years showing positive correlation between screen time and autism. [Wu, 2017.](#)

From baseline to post-treatment, study participants made significant progress in all areas of functioning, including psychological symptomatology, social skills, pro-social behaviour, and peer relationships, attributable to a novel behavioural intervention in the treatment of outdoor autism spectrum disorders. [Villalobos, 2016.](#)

Through a process of neuroplasticity, autistic infants develop skills that are driven by audiovisual viewing. The developed neuronal pathways for audiovisual processing compete with a preference for social processing, affecting the development of social brain pathways and causing a global developmental delay. [Frankel Heffler, 2015.](#)

"Romania's Abandoned Children" suggests that toddlers exposed to more than 4 hours a day in front of a screen should be described as experiencing "severe emotional deprivation" and illustrates a dose/effect relationship between screen time and autism. [Nelson, 2014.](#)

Even after controlling for age and amount of time spent playing video games, problematic game use and the genre of role-playing games were significant predictors of oppositional behaviour. The findings emphasise the clinical significance of investigating video game use patterns in children with ASD. [Mazurek, Feb 2013.](#)

Boys with Autism Spectrum Disorder spend significantly more time playing video games than boys with Typical Development (TD), and they are more likely to engage in problematic video game use than boys with TD. [Mazurek, Aug 2013.](#)

Individuals with autism spectrum disorder were found to use certain electronics more frequently in the previous month and on an average day, as well as to engage in more compulsive Internet and video game use than those without autism spectrum disorder. [MacMullin, 2013.](#)

The majority of adolescents with ASD (64.2 percent) spent the majority of their free time on non-social media (television, video games), while only 13.2 percent spent time on social media (email, internet chatting); when compared to other disability groups (speech/language impairments, learning disabilities, intellectual disabilities),

the ASD group had higher rates of non-social media use and lower rates of social media use. [Mazurek, 2012.](#)

Data indicate that an excessive number of internet users have deficits in the early stage of face-perception processing but may have intact holistic/configural processing of faces. [He, 2011.](#)

Children born after shorter intervals between pregnancies are more likely to develop autism. [Cheslack-Postava, 2011.](#)

Unusual sensory processing is found in people with Autism Spectrum Disorders throughout their lives, and it has consequences for both therapy and diagnosis of ASD in adults. [Crane, 2009.](#)

There are no reliable, valid, or replicable studies showing genetic evidence for any psychiatric disorders, including ADHD, Autism, bipolar disorder, schizophrenia, depression or anxiety. [Joseph, 2003](#) & [Baughman, 2009.](#)

Sensory processing impairment was seen in 95 percent of autistic children. [Tomchek, 2007.](#)

69% of children with Autism demonstrated sensory symptoms on the Sensory Experiences Questionnaire. [Baranek, 2006.](#)

Touch treatment reduced touch aversion, off-task behaviour, orienting to irrelevant sounds, and stereotypic behaviours in children with Autism. [Field, 1997.](#)

Screen addiction/treatment

Internet Use Disorder is a rapidly growing behavioural addiction; this condition has been linked to a number of structural and functional brain changes. [Darnai, 2022.](#)

24.5 percent of adolescents were found to be addicted to video games. Research profiles useful intervention module for reducing video game addiction in adolescents, as. [Goswami, 2022.](#)

Short-term abstinence from gaming that is intentional and under control reduces Internet Gaming Disorder and improves mental health. [Brailovskaia, 2022.](#)

The prevalence of IGD among Chinese adolescents (ages 12-19) was 4.6%. This study provides evidence for retaining or deleting specific diagnostic criteria by the DSM framework in the future. [Luo, 2022.](#)

Among Internet Gaming Disorders, the five most commonly reported health-related variables are depression (67 times), internet addiction (54 times), anxiety (48 times), impulsivity (37 times), and attention deficit hyperactivity disorder (24 times). [Darvesh, 2020.](#)

Technology is a new addiction; the social networking app Snapchat is used by 78 percent of Americans between the ages of 18 and 24, with the majority of users (71 percent) using it numerous times per day. [Captain Ryan, 2018.](#)

Selfitis Behavior Scale may be a reliable and valid tool for assessing selfitis (the obsession of taking selfie pictures). [Balakrishnan, 2018.](#)

Due to distinctions in methodologies, the global incidence of Internet Gaming Disorder ranges from 0.7 to 27.5 percent. [Mihara, 2017.](#)

The study's conclusions offer recommendations for the design and efficient implementation of future interventions for Internet addiction among Korean teenagers. [Chun, 2017.](#)

In recent years, there has been a significant increase in research into Internet Gaming Disorder; however, research on its psychological treatment is still limited, particularly in terms of the efficacy of specific programmes. [Torres-](#)

[Rodríguez, 2017.](#)

The shortened version (6-item) of the Problematic Internet Use Questionnaire also appears to be an appropriate method of distinguishing between Internet users exposed to problematic Internet use and those who are not.

[Demetrovics, 2016.](#)

Addiction treatment specialists believe that the fundamental reason addicts stay addicted is less about pleasure-seeking and more about the need to escape and disassociate from the sorrow of his or her (often trauma-based) emotional isolation. [Weiss, 2016.](#)

Addiction to the Internet has been connected to functional alterations in the prefrontal cortex, as well as changes in other cortical (e.g., temporal) and subcortical (e.g., ventral striatum) regions, and manifests itself in loss of control over Internet use resulting in personal distress, symptoms of psychological dependence, and various negative consequences. [Brand, 2014.](#)

The structural trait that predicted addiction was its social component, and increased sociability was associated with higher levels of addiction-like experiences. [Hull, 2013.](#)

After twelve weekly sessions, Cognitive Behaviour Therapy-IA was found to be beneficial in alleviating symptoms related with Internet addiction for one month, three months, and six months after therapy. [Young, 2013.](#)

In adolescents with online gaming addiction (OGA), the amplitude of low frequency fluctuation values in the left medial orbitofrontal cortex and left precuneus were positively linked with the duration of OGA. [Yuan, Nov 2013.](#)

In late adolescence with online gaming addiction, imaging data demonstrated increased cortical thickness in the left precentral cortex, precuneus, middle frontal cortex, inferior temporal, and middle temporal cortices. [Yuan, Jan 2013.](#)

The right orbitofrontal cortex, bilateral insula, and right supplementary motor region all demonstrated significant grey matter degeneration in Online Gaming Addicts. [Weng, 2013.](#)

According to data from 2257 students at an English university, 3.2 percent of the students were addicted to the Internet. [Kuss, 2013.](#)

Individuals with Internet addiction problem demonstrated increased sensitivity to winning and decreased sensitivity to losing. [Dong, 2013.](#)

Adolescents with internet addiction have changes in the orbitofrontal cortex, which are a common neurobiological marker of addiction-related conditions in general. [Hong, 2013.](#)

In the absence of global alterations in brain functional network structure, internet addiction is linked to a decrease in functional connectivity in cortico-striatal circuits. [Hong, 2013.](#)

Study found abnormal spontaneous brain activity associated with poor task performance in youth who have internet addiction. [Yuan, 2011.](#)

The grey matter density in the left anterior cingulate cortex, left posterior cingulate cortex, left insula, and left lingual gyrus was lower in Internet addiction teenagers. [Zhou, 2011.](#)

Populations are becoming more addicted to the Internet as it becomes more accessible. Parental bonding characteristics were the best predictor variables for Internet and computer addiction. [Siomos, 2012.](#)

Internet addiction disorder (IAD) can cause substantial brain damage, and neuroimaging data show that IAD is linked to dopaminergic brain system failure. [Hou, 2012.](#)

When compared to their healthy peers, men with internet addiction problem showed considerably more 'Stroop effect'-related activity in the anterior and posterior cingulate cortices. [Dong, 2012.](#)

The findings suggest that people who are addicted to the Internet have higher levels of trait impulsivity than people who are diagnosed with pathological gambling. [Lee HW, 2012.](#)

Fractional anisotropy in major white matter pathways was found to be reduced in Internet addiction disorder, and this altered white matter structure may be associated to various behavioural abnormalities. [Lin, 2012.](#)

In subdivisions of the striatum, people with Internet addiction have lower levels of dopamine D2 receptor availability. [Kim, 2011.](#)

Mood disorders were found to have a statistically significant link to a higher Internet Addiction Test score. [Liberatore, 2011.](#)

Lower academic success, higher truancy, shorter sleep time, limited leisure activities, and increased thoughts of suicide are all associated with video game addiction. [Rehbein, 2010.](#)

Parental rearing behaviours were commonly evaluated as intrusive, repressive, and unresponsive by adolescents with Internet Addiction Disorder. [Xiuqin, 2010.](#)

Cravings or urges to play video games cause brain alterations comparable to drug cravings. [Ko, 2009.](#)

Previous research had employed inconsistencies in classifying Internet addicts, according to the findings; scientists were given suggestions on how to strengthen this new branch of research. [Byun, 2009.](#)

The goal of the study was to evaluate alexithymia, dissociative experiences and Internet addiction in undergraduate students. [De Berardis, 2009.](#)

Internet addicts are more lonely and have lower self-esteem and weaker social skills than moderate users. [Ghassemzadeh, 2008.](#)

Video game addiction can be statistically predicted based on measures of aggression and poor academic performance. [Chiu, 2004.](#)

Two credible measures of television addiction were produced by composing items to mirror known criteria used in psychiatry for the diagnosis of drug dependency in an effort to find a way to empirically distinguish between normal and problem television viewing. [Horvath, 2004.](#)

Dopamine deficit

Overexposure to digital environments now affects even the youngest (ages 0 to 2) and triggers a chain of interdependent negative and potentially long-lasting metabolic changes; this deregulates the serotonin and dopamine neurotransmitter pathways in the developing brain, similar to severe substance abuse syndromes. [Dresp-Langley, 2020.](#)

Psychotropic medication

Cohort study shows that within a large community-based health care network, most preschool-aged children with PCP-diagnosed ADHD or ADHD symptoms were NOT offered first-line, evidence-based behavioral treatment. [Bannett, 2022.](#)

Research relating to serotonin production show little consistent evidence to indicate a correlational relationship between serotonin and depression [Moncrieff et al., 2022.](#)

Some evidence was consistent with the possibility that long-term antidepressant use reduces serotonin concentration [Moncrieff et al., 2022.](#)

The use of antipsychotics in privately insured young children decreased from 2009 to 2017. Despite this, the majority of use still remains off label and for situations for which there is insufficient evidence of efficacy and safety. [Bushnell, 2021.](#)

Polypharmacy was common among the 26 722 people with autism spectrum disorder ranging from 28.6% to 31.5 percent. [Feroe, 2021.](#)

Despite limited evidence of efficacy and mounting safety concerns, the use of medication from two or more psychotropic classes has increased among US youths; the most common diagnosis among youths who received psychotropic polypharmacy is attention deficit/hyperactivity disorder. [Zhang, 2021.](#)

Psychiatric Drugs informs law enforcement, legislators, policymakers, healthcare professionals, and educators about the risks of psychotropic drugs causing violent, illogical, and suicidal conduct, as well as the severe side effects of withdrawal. [Eastgate, 2018.](#)

"*The Spiral Notebook*" is packed with interviews with Generation Z, a generation plagued by big pharma with anti-depressants and ADHD medications, a doomsday/apocalyptic worldview present from birth, and an entertainment industry that has turned violence into parlor games. [Singular, 2015.](#)

Antipsychotics have a subtle but measurable effect on brain tissue loss over time, suggesting the importance of careful risk-benefit review in terms of dosage and duration of treatment, as well as their off-label use in children. [Ho, 2011.](#)

Reports and Publications. Children who use ADHD medication have lower academic performance and a higher risk of cardiac problems, according to the Department of Health. [Government of Western Australia, 2010.](#)

"*Side Effects*" provides a comprehensive picture of the disgraceful self-serving links that exist between drug firms and the psychiatric profession. [Bass, 2009.](#)

Twenty percent of children on ADHD stimulants exhibited an increase in heart rate and/or systolic and diastolic blood pressure, according to a three-year follow up study of treated ADHD patients. [Winterstein, 2009.](#)

Since the early 1990s, case reports and small case series have frequently raised concerns that stimulants may increase the risk of sudden unexplained death in children. [Vitiello, 2009.](#)

Even very young children with autism spectrum disorders frequently take psychotropic medications. Factors unrelated to clinical presentation appear to be strongly linked to prescribing practices. [Mandell, 2008.](#)

"*Medication Madness*" exposes the psychiatric drugs' harmful and severe side effects. [Breggin, 2008.](#)

An objective, well-informed examination of the widespread use of Ritalin in young children with Attention Deficit

Disorder discusses the drug's ethical and social consequences, as well as suggestions for those considering its usage. [Diller, 2008.](#)

After receiving stimulant medication, there is a drop in growth rates, according to the study. [Swanson, 2007.](#)

The percentage of visits resulting in a psychotropic prescription rose from 3.4 percent in 1994-1995 to 8.3 percent in 2000-2001; by 2001, one out of every ten adolescent male visits to the doctor resulted in a psychiatric medication prescription. [Thomas, 2006.](#)

Two children (out of 43) taking fluvoxamine, a serotonin reuptake inhibitor, exhibited drug-induced apathy (neither of them had a depressive illness). [Reinblatt, 2006.](#)

Nearly one-third of youths who received any psychotropic treatment used multiple psychotropic medications. [dosReis, 2005.](#)

Stimulants are increasingly being used to treat attention deficit/hyperactivity disorder. [Ruff, 2005.](#)

Antidepressant-treated depressed children are more prone to harm themselves than depressed children treated with placebo. [Lenzer, 2004.](#)

There was a proportional increase in females receiving stimulants and males receiving antidepressants during the decade, especially among the 10- to 14-year-olds. [Zito, 2003.](#)

In the 1990s, the use of antidepressants among teenagers surged. [Zito, 2002.](#)

GPs and pediatricians play a role in the in-office treatment of adolescents with psychotropic drugs. In this study, most psychotropic drug prescriptions (84.8%) were issued by general practitioners or pediatricians. [Goodwin, 2001.](#)

Between 1991 and 1995, the number of preschoolers administered psychotropic drugs climbed drastically. [Zito, 2000.](#)

Cognitive

Executive function

Executive functioning was impaired in young children who were exposed to extensive periods of everyday background TV. [Nichols, 2022.](#)

Early-life threat and deprivation experiences were linked to lower executive functioning, but the link was higher for deprivation exposure. [Johnson, 2021.](#)

High screen time contributes to adverse cognitive, executive function, and behavior outcomes at ages 6 to 7 years in children born extremely premature. [Vohr, 2021.](#)

The executive function of four-year-old children was found to be significantly reduced after watching the Spongebob cartoon for nine minutes. [Christakis, 2011.](#)

High levels of exposure to adult-oriented television programming during infancy and at age four, as well as high levels of household television viewing at age four, were all linked to lower executive functioning at age four. [Barr, 2010.](#)

People with amnesia who played the Tetras video game, were able to describe Tetra's visual images at sleep onset, demonstrating that remote memories can influence the images from a recent awaking. [Stickgold, 2000.](#)

Attention deficit

Most preschool children with symptoms of ADHD or ADHD who were diagnosed by primary physicians were not offered evidence-based behavioral treatment. [Bannett, 2022.](#)

An in-depth inspection was conducted on a high-profile study that suggested that ADHD is a risk factor for infection with COVID-19 and that stimulants reduce that risk. Seven manipulations and spins were identified, including inappropriate operational definitions, misrepresentations, and omissions that produced bogus results and might have concealed potential adverse effects of medications. These distortions illustrate how biased science can contribute to the ethically problematic phenomena of overdiagnosis and overmedication. [Ophir, 2021.](#)

Clinical practice guidelines emphasize parent training in behavior management (PTBM) as the first-line treatment for children aged 4 to 5 years with a diagnosis of ADHD or ADHD symptoms given stronger evidence for PTBM vs ADHD medications such as methylphenidate. [Wolraich, 2019.](#)

Brain structural changes related to cognitive control and emotional regulation are associated with digital media addictive behavior. Screen time induced adhd-related behavior could be inaccurately diagnosed as adhd. Screen time reduction is effective in decreasing adhd-related behavior. [Lissak, 2018.](#)

Even when people manage to maintain constant attention - for example, avoiding the temptation to check phones – merely having these devices nearby diminishes available cognitive capacities; furthermore, people who are the most addicted to smartphones face the biggest cognitive consequences. [Ward, 2017.](#)

Expanding stimulant medications in the community for ADHD seemed to have no positive effects and may have been hazardous considering how these medicines are commonly used in the community. [Currie, 2014.](#)

In the last 30 years, ADD/ADHD has become an epidemic. Before the age of 18, one in every seven boys was diagnosed with this disease. [Peper, 2014.](#)

The findings revealed that among children exposed to lead, a heavier voice connection using a mobile phone was associated with an increased risk of developing ADHD symptoms. [Byun, 2013.](#)

Evidence suggests that ADHD and SMD are distinct diagnoses. [Miller, 2012.](#)

During childhood, watching TV and playing video games has been linked to an increase in potential attention problems. [Swing, 2010.](#)

A study on sensory overactivity in children with ADHD shows a solid association between sensory overactivity and anxiety in both typical children and children with ADHD. [Lane, 2010.](#)

"iBrain" focuses on how technology's inevitable march forward has changed how young minds develop, function, and comprehend data. [Small, 2009.](#)

The ADHD criteria were met by 9% of American children aged 8 to 15 years. [Rapport, 2009.](#)

The most common symptom of Internet Addiction was ADHD, followed by impulsivity. [Yen, 2009.](#)

Twenty minutes of walking in a park was enough to improve attention performance in children with ADHD when compared to the same amount of time in other environments. [Kuo, 2009.](#)

The prevalence of ADHD, and thus the need for psychostimulant medications in growing children, may be reduced if we create play sanctuaries for preschool children, where they can play naturally with each other, facilitating frontal lobe maturation and the healthy development of pro-social minds. [Panksepp, 2008.](#)

Youths who watched three or more hours of television per day were at a higher risk of developing attention problems later in life and were the least likely to pursue postsecondary education; in the association of television viewing with attention and learning difficulties, there was little evidence of bidirectionality. [Johnson, 2007.](#)

To see if effective therapy can minimize the onset, persistence, and severity of problems that co-occur with adult ADHD, more research is needed. [Kessler, 2006.](#)

In 2003, it was estimated that 4.4 million children aged 4 to 17 had been diagnosed with ADHD. [CDC, 2005.](#)

At the age of seven, early television exposure is linked to attentional issues; efforts to reduce early children television viewing may be warranted. [Christakis, 2004.](#)

ADHD symptoms are significantly reduced when people are exposed to "green space." [Kuo, 2004.](#)

Half of the diagnosis of ADHD was initially suggested by teachers. [Sax, 2003.](#)

"*Attention Deficit Hyperactivity Disorder*" brings together the leading experts in the field of ADHD to address the issues and controversies surrounding the disorder scientifically. [Jensen, 2002.](#)

"*Scattered Minds*" debunks the notion of Attention Deficit Disorder as a genetically determined condition, written from the inside out by someone who has ADD himself, with the wisdom obtained through years of medical practise and research. [Mate, 2000.](#)

"Attention inconsistency" is a better word for ADHD. The three tenets of Attention Restorative Theory are as follows: 1) The ability to pay attention is sensitive to exhaustion and restoration. 2) Those that are voluntary and exciting are less tiring than tasks that are involuntary and dull. 3) The ability to pay attention is affected by changes in the surroundings. [Kaplan S 1995.](#)

Learning disorders

Children 3-5 years of age who used screens longer than recommended had lower measures of microstructural organization and myelination of white matter pathways in the brain that support language skills and development of literacy and corresponding cognitive assessments. [Hutton, 2020.](#)

The language cues made it difficult for the infants to imitate activities at levels far above those observed when such language treatments were not used. [Zack, 2013.](#)

Ayres's eight articles (1965-1987) containing 10 multivariate analyzes based on her concept of sensory integration do not support her claim and are of no value for diagnostic procedures or remedial programs for children with learning disabilities. [Cummins, 1991.](#)

Multitasking stress

More than four out of five adults in the United States say they check their email, messages, and social media accounts frequently or continuously a decade after cellphones, Facebook, and Twitter were introduced, resulting in higher stress levels for these Americans. [APA, 2017.](#)

Multitasking on a laptop is a significant source of distraction for both users and fellow students, and it can make it difficult to understand class material. [Sana, 2013](#).

The unique relationship between media multitasking and these measures of psychosocial dysfunction suggests that the growing trend of media multitasking may be a unique risk factor for anxiety and mood related mental health problems. [Becker, 2013](#)

People switched media at an extreme rate (about 4 switches per minute and 120 switches in 27.5 minutes) and recalled their switching behavior on average for only 12% of their actual switching rate. [Brasel & Gips, 2011](#).

Academic performance

Participants' predicted enjoyment and engagement for a waiting task were significantly less than what they actually experienced. These results suggest an inherent difficulty in accurately appreciating how engaging just thinking can be, and could explain why people prefer keeping themselves busy, rather than taking a moment for reflection and imagination in our daily life. [Hatano 2022](#).

During the 2020-21 academic year, women made up 59.5% of college students and men 40.5%. U.S. colleges and universities had 1.5 million fewer students compared with five years ago, and men accounted for 71% of the decline. In an increasing education disparity across the United States, the number of males enrolled in two- and four-year colleges has fallen to record lows. [Belkin, 2021](#).

A greater quantity of screen use was negatively related to the child's language, while better quality screen use (educational programs and co-viewing with caregivers) was positively related to the child's language skills. [Madigan, 2020](#).

The placement of electronic devices in child bedrooms is believed to negatively impact school readiness, especially in families with lower social economic status [\(Fu et al., 2017\)](#).

Adolescents are less likely to follow academic pursuits and engage in structured after-school activities which positively impact social and interpersonal development if technology use is excessive, or if technology use interferes with said activities [\(Przybylski & Weinstein, 2017\)](#).

Average final exam scores in schools that allowed computers were 0.18 standard deviations lower than exam scores in classrooms that did not allow computers. [Carter, 2017](#).

The mean final exam scores of students assigned to computing-enabled classes were 18 percent standard deviations lower than the student's final exam scores of students in classrooms that prohibited computers. [Payne, 2016](#).

On conceptual problems, students who took notes on laptops did worse than those who took notes longhand; the tendency of laptop note takers to reproduce lectures verbatim rather than analyzing and reframing material in their own terms is harmful to learning. [Mueller, 2014](#).

Participation in physical activity has a positive effect on children's academic performance. [Singh, 2012](#).

At 29 months, each additional hour of television exposure resulted in 7% and 6% unit declines in classroom engagement and math achievement; 9 percent unit decreases in activities requiring physical exertion; 10% unit increases in victimization by classmates; 13% unit decreases in time spent doing weekend physical activity; 9% unit decreases in activities requiring physical exertion; 9% and 10% unit increases in soft drink and snack consumption; and 5% unit increases in body mass index. [Pagani, 2010](#).

The more time students spend using media and the more violent the content is, the worse their grades at school will be, even when controlling for critical factors such as family, educational, or immigrant background. [Mössle, 2010.](#)

About 8% of video game players displayed abnormal play patterns. The presence of pathological gaming was found to be a strong predictor of low academic performance. [Gentile, 2009.](#)

The recess period is an important part of the primary school curriculum as it improves the cognitive abilities of children and helps them adjust to school. [Pelligrini, 2005.](#)

Television viewing during childhood (ages 5-11) and adolescence (ages 13 and 15) was linked to worse educational achievement later in life. [Hancox, 2005.](#)

Comparative literary examinations conducted in 1994 and 2003 indicated that 15% of Canadians scored at level one and only 50% at level three in the four literacy domains (at 5 levels of the ranking where level one was the lowest). [Sloat, 2000.](#)

'Covid Effect' reversal initiatives

Less than half of the estimated 52.9 million adults experienced mental illness in 2020 received mental health services. The COVID-19 pandemic made the problem worse. [Muñoz, 2022.](#)

International review of the impacts of school closures on the health and well-being of children during the first wave of the pandemic and urges a balance between measures to contain infectious disease and to bolster the physical and mental health of children. [Viner, 2022.](#)

The burden to reduce screen time cannot fall to parents and families alone. Policies are needed to avoid closures of schools and recreation and ensure alternatives to screen time for children and youth of all ages that promote socialization and physical activity. In addition, there are key equity considerations when it comes to accessibility of alternatives to screen time such as child care and community recreation. [Toombs, 2022.](#)

Education systems reaction and processes need to develop to reflect the expanding body of information and study on the negative effects of Covid closures on children's health, well-being, and life expectancy. [Dooley, 2022.](#)

Physical activity engagement and child movement behaviours such as sleep habits, and sedentary behaviour were significantly impacted by Covid-19. Participation in physical activity yields protective results and reduce the severity/prevalence of negative mental health outcomes associated with Covid-19 in children [Caldwell et al., 2022.](#)

Should Covid-19 pandemic restrictions persist in various jurisdictions, parents should consider incorporating more physical activities into their child's daily routines [Caldwell et al., 2022.](#)

Replacing sedentary learning activities with movement-based learning activities and replacing screen-based learning activities with non-screen-based learning activities, can support student's health and wellbeing [Sanders et al. 2022.](#)

To achieve the best health and educational outcomes, school districts should implement some or all of the AAP guidance measures and prioritize them based on local COVID-19 incidence, key stakeholder input, and budgetary constraints. [Wang, 2021.](#)

The incidence of depression and anxiety symptoms during COVID-19 has doubled compared to pre-pandemic estimates. [Racine, 2021.](#)

Study results suggest that virtual learning may pose a greater risk than personal learning related to the mental and

emotional health of the child and parents. [Verlenden, 2021.](#)

Child and youth screen time has substantially increased during Covid-19. Research suggests that increased reliance on screen time during Covid-19 harms physical, cognitive and mental health for children and youth [\(Gilbert et al., 2021\).](#)

Setting and monitoring screen time limits, discussing impacts of screen use, taking frequent breaks, incorporating movement throughout the day, encouraging adults to practice healthy screen use and tapering screen use are effective measures to reduce harmful effects on children and youth by decreasing screen time [\(Gilbert et al., 2021\).](#)

School closings during the COVID-19 pandemic impacted children's academic learning gains; in particular, mathematics performance was significantly lower than in the typical school year. [Northwest Evaluation Association \(NWEA\), 2020.](#)

The findings revealed that there was a significant increase in indicators of anxiety, post-traumatic stress disorder, depression, and behavioural challenges during COVID-19 and beyond when compared to indicators typically found in the general child population. [Waddell, 2020.](#)

Due to the unique combination of the public health crisis, social isolation, and economic recession, the COVID-19 pandemic may exacerbate existing mental health problems and lead to an increase in cases among children and adolescents. [Golberstein, 2020.](#)

Based on US data, this decision analysis model of years of life potentially lost under various scenarios of school closure; the findings favoured keeping schools open. [Christakis, 2020.](#)

Brain injury

Patients (12-25 years) with concussion who refrained from screen time during the first 48 hours of recovery had a statistically significantly shorter duration of symptoms (3.5 days) than those allowed to screen time (8 days). [Macnow, 2021.](#)

WIRELESS RADIATION AND HUMANS

Wireless expansion

The number of satellites orbiting the globe has expanded from 2,000 to 4,800 in the last two years, and a wave of new projects has pushed the total number of operational, approved, and proposed satellites to at least 441,449. And that figure only covers satellites in low-earth orbit (LEO) that will be in the ionosphere. [Firstenberg, 2022.](#)

Wireless controversy

Five of the six members of the Core Group in charge of the development of a Monograph on RF Fields and Health for public comment are involved with the International Commission on Non-Ionizing Radiation Protection (ICNIRP), an industry loyal NGO, creating a severe conflict of interest; the assessment of the non-thermal biological effects of RF radiation was rejected as scientific evidence of adverse health effects in the monograph which prompted many objections sent to the WHO. [Hardell, 2017.](#)

Wireless safety

Wireless technology has yet to be adequately assessed in the context of being a human and environmental hazard ([Khan et al., 2022](#)).

Current Radiofrequency Radiation (RFR) exposure limits fail to account for “potential synergistic effects that reflect modern day exposures to multiple environmental agents,” ([Environmental Health, 2022](#)).

This essay by a prominent UK epidemiologist identifies four relevant sources of scientific uncertainty and concern and based on the precautionary principle, echoes the calls of others for a moratorium on the further roll-out of 5G systems globally, pending more conclusive research on their safety. ([Frank, 2021](#)).

- Lack of clarity about precisely what technology is included in 5G;
- Rapidly accumulating body of laboratory studies documenting disruptive in vitro and in vivo effects of RF-EMFs-but one with many gaps in it;
- Almost total lack (as yet) of high-quality epidemiological studies of adverse human health effects from 5G EMF exposure specifically, but rapidly emerging epidemiological evidence of such effects from past generations of RF-EMF exposure;
- Persistent allegations that some national telecommunications regulatory authorities do not base their RF-EMF safety policies on the latest science, related to unmanaged conflicts of interest.

Radiation standards for cellphones, based on a binary distinction between thermal and nonthermal radiation, do not protect against the neurophysiological effects of cellphone radiation. ([Marino, 2017](#)).

The article provides a non-exhaustive view of the effective measures that must be implemented in the field of non-ionizing electromagnetic radiation to protect future generations. ([Markho, 2016](#)).

“*Wireless Radiation Rescue*” contains advice on how to make mobile phones and other wireless technology safer. ([Crofton, 2011](#)).

This bibliography contains over 2300 references on biological responses to radio frequency and microwave radiation that were published up until April 1972. ([Glaser, 1971](#)).

Experimental research

National Institute of Health – National Toxicology Program

EMR-2450 MHz induces stress and exacerbates anxiety-like symptoms in rats and causes the death of both necrotic and apoptotic cells. ([Gupta, 2019](#)).

EMF interferes with neural stem cell production and differentiation during embryonic development, as well as the reproductive and neurological health of individuals who have been exposed prenatally. ([Kaplan, 2016](#)).

The researchers concluded that RF EMFs are carcinogenic in male rats but not in female rats or mice (US National Toxicology Program only). ([ICNIRP \(pp. 525-532\), 2020](#)).

Cell Phone Radio Frequency Radiation (nih.gov)

National Toxicology Program, National Institute of Health. NTP conducted two-year toxicology studies in rats and mice to help clarify potential health hazards, including cancer risk, from exposure to RFR like that used in 2G and 3G cell phones which operate within a range of frequencies from about 700–2700 megahertz (MHz). These were published as Technical Reports in November 2018. NTP uses a [standard scale \(graphic of NTP’s Level of Evidence](#)

[Rating System for Cancer Studies](#)) to determine the strength of the evidence for an association between the exposure and findings in the tissues or organs studied. The scale ranges from the highest rating of “clear evidence,” followed by “some evidence,” then “equivocal evidence,” and finally “no evidence.” Different organs or tissues can have different conclusions.

The NTP studies found that high exposure to RFR (900 MHz) used by cell phones was associated with:

- **Clear evidence of an association with tumors in the hearts of male rats.** The tumors were malignant schwannomas.
- **Some evidence of an association with tumors in the brains of male rats.** The tumors were malignant gliomas.
- **Some evidence of an association with tumors in the adrenal glands of male rats.** The tumors were benign, malignant, or complex combined pheochromocytoma.

It was unclear if tumors observed in the studies were caused by exposure to RFR in female rats (900 MHz) and male and female mice (1900MHz).

As a follow-up, NTP published an [article](#) in October 2019 that evaluated DNA damage in three regions of the brain, the liver, and in blood cells in rats and mice that were removed at an earlier timepoint from the ongoing 2-year toxicology study. DNA damage, if not repaired, can potentially lead to tumors. This work was also included in NTP’s published Technical Reports, but this study includes analyses of the data in the supporting information not included in the Technical Reports. NTP scientists found that RFR exposure was associated with an increase in DNA damage. Specifically, they found RFR exposure was linked with significant increases in DNA damage in:

- the frontal cortex of the brain in male mice,
- the blood cells of female mice, and
- the hippocampus of male rats.

There are many factors that influence whether damaged DNA will lead to tumors. NTP plans to conduct additional studies to learn more about how RFR might cause DNA damage. Please see the FAQs below for more information about the specific studies and NTP’s cell phone RFR program.

Epidemiological studies

Sperm DNA/motility

Fertility rates in the United States have dropped to new lows, and smartphone adoption is inversely related. [Franki, 2020.](#)

Wi-Fi causes oxidative stress, sperm/testicular damage, and neuropsychiatric effects such as EEG abnormalities, apoptosis, cellular DNA damage, endocrine alterations, and calcium excess. [Pall, 2018.](#)

Different non-thermal microwave EMF exposures produce a variety of neuropsychiatric effects. [Pall, 2015.](#)

RF-EMR enhances mitochondrial reactive oxygen species generation by human spermatozoa, decreasing the motility and vitality of these cells while stimulating DNA base adduct formation and, ultimately DNA fragmentation. These findings have clear implications for the safety of extensive mobile phone use by males of reproductive age, potentially affecting both their fertility and the health and wellbeing of their offspring. [De Illis 2013.](#)

Human sperm motility is reduced and sperm DNA breakage is increased when laptop computers are connected to the

internet via Wi-Fi. [Avendano, 2012.](#)

Statistical analysis of sperm head abnormality score showed that there was a significant ($p < 0.05$) difference in occurrence of sperm head abnormalities in test animals. The major abnormalities observed were knobbed hook, pin-head and banana-shaped sperm head. The occurrence of the sperm head abnormalities was also found to be dose dependent. [Otitoloju 2010.](#)

RF-EMR in cell phones reduces the motility and vitality of spermatozoa while stimulating the formation of basic DNA adducts and, ultimately DNA fragmentation. [De luliis, 2009.](#)

Physiological effects

The majority of research on the use of non-ionizing radiation cosmetic devices has concentrated on treatment efficacy rather than side effects or complications; mild and transient pain, erythema, swelling, and changes in pigmentation are all common side effects on the skin. [ICNIRP \(pp.562-579\), 2020.](#)

The potential for wireless technology radiation to cause serious biological effects has significant implications, necessitating a re-evaluation of its near-ubiquitous presence, particularly in hospitals and medical facilities. [Kleiber, 2017.](#)

Microwaves cause biological effects at non-thermal levels by activating voltage-gated calcium channels, supporting a paradigm shift in microwave/lower frequency electromagnetic field action. [Pall, 2015.](#)

Oxidative stress, single and double-strand breaks in cellular DNA, cancer, male and female infertility, lowered melatonin/sleep disruption, cardiac changes including tachycardia, arrhythmia, and sudden cardiac death, diverse neuropsychiatric effects including depression, and therapeutic effects are all biological responses to non-thermal exposures; pulsed fields are more active than non-pulsed fields in most circumstances and exposures within specified intensity windows have far more substantial biological impacts than exposures at lower or higher intensities. [Pall, 2015.](#)

The Biological Effects Chart was created using data from a comprehensive new evaluation of the medical research literature (which included 67 studies) on the biological effects of electromagnetic fields. [Bioinitiative Working Group, 2014.](#)

The data is strong enough to justify new public exposure guidelines based on low-intensity (non-thermal) exposure levels now recognized to be physiologically disruptive, as well as strong, interim preventative measures. [Herbert, 2013.](#)

The current research supports a biological action route of ultralow frequency and microwave EMFs, nanosecond pulses, and static electrical or magnetic fields: EMF activation of VGCCs leads to fast elevation of intracellular Ca^{2+} , nitric oxide, and, in certain situations, peroxynitrite; the Ca^{2+} /nitric oxide/cGMP/protein kinase G pathway could potentially mediate therapeutic benefits. [Pall, 2013.](#)

There may be a link between being exposed to a magnetic field and cell death. [Emre, 2011.](#)

Exposure of the whole body to pulse-modulated RF radiation, which is similar to that emitted by Global Systems for Mobile Communications (GSM) cell phones, can cause pathological changes in the thyroid gland. [Esmekaya, 2010.](#)

Time-varying electromagnetic waves have the potential to temporarily modulate the nervous system, especially when neuron populations are required to work together. [Thornton, 2006.](#)

Cognition and behavior

The results suggest that 2400-MHz RF-EMR cell phone radiation damages the anatomical integrity of the hippocampus, resulting in behavioural alterations like anxiety; study raise awareness of the long-term dangers of RF-EMR exposure. [Hasan, 2021.](#)

When rats are exposed to microwave radiation at 2.45 GHz, their brains undergo negative changes, including a decrease in learning and memory, as well as the manifestation of anxious behaviour, as well as a decrease in brain antioxidant enzyme systems. [Varghese, 2018.](#)

In adolescent mice, exposure to radio frequency fields had no effect on depression-like behaviour, spatial memory, or brain histology, but it can increase anxiety levels. [Zhang, 2017.](#)

Research compilation on cell phone radiation, behavior and brain development. [Hugh, 2016.](#)

Vision

The shift to grayscale makes smartphones less satisfying and can help people control their smartphone use. [Holte, 2020.](#)

Several in vitro and animal studies have shown that blue and white LEDs can potentially cause retinal cell damage when exposed to high irradiance and for long periods of time; more research on the potential health effects of short- and long-term exposure to new and emerging lighting technologies is required. [ICNIRP \(pp.549-561\), 2020.](#)

Further research has supported amending the retinal thermal exposure limits in terms of spot size dependence, pulse duration dependence for short pulses, and wavelength dependence between 1,200 nm and 1,400 nm. [ICNIRP \(pp.271-295\), 2013.](#)

Brain tumors

The risks of glioma from mobile phone are likely to be higher than published. [Morgan 2015.](#)

A study in France supporting previous finding concerning a possible association between heavy mobile phone use and brain tumors. [Coureau 2014.](#)

There is a link between mobile and cordless phone use and acoustic neuroma, according to this study. [Hardell, 2013.](#)

A study of prior cell phone use (up to 2004) discovered a 40% increase in the incidence of glioblastoma in the most heavy users (reported average: 30 minutes per day over 10 years). [WHO, 2011.](#)

The use of a cell phone for 50 minutes was linked to an increase in brain glucose metabolism. [Volkow, 2011.](#)

Cell phone use for more than or equal to ten years nearly doubles the risk of being diagnosed with a brain tumor on the same side of the head. [Khurana, 2009.](#)

Breast cancer

Excessive smartphone use significantly increased the risk of breast cancer, particularly for participants with smartphone

addiction, a close distance between the breasts and smartphone, and the habit of smartphone use before bedtime. [Shih 2020](#).

Cancer incidence statistics

Prenatal

Findings give new epidemiological evidence that high maternal magnetic field levels in pregnancy may raise the risk of asthma in offspring. [Li, 2011](#).

Although the exact process is unknown, it is believed that pyramidal cell loss in the cornu ammonis could be caused by prenatal exposure to 900 megahertz electromagnetic fields. [Bas, 2009](#).

Pediatric

A correlational relationship appears to exist between childhood exposure to extremely low frequency (ELF) magnetic fields (MFs) and melanoma during adulthood [\(Khan et al., 2022\)](#).

Extremely low frequency (ELF) magnetic fields (MFs) are believed to yield carcinogenic effects; especially during childhood exposure [\(Khan et al., 2022\)](#).

Review of scientific literature on effects of EMF on children concludes the following:

- The nervous systems of children are more vulnerable to the effects of electromagnetic waves than adults.
- The exposure to electromagnetic fields (EMFs) among children should be minimized.
- According to International Agency for Research on Cancer EMFs are possibly carcinogenic, it should not be overlooked or interpreted with bias. [Moon, 2020](#).

Children's brains and eyes absorb higher doses of local radiation than adults and are therefore more susceptible to dangerous exposure. [Fernández, 2018](#).

Autism Spectrum Disorders-related genes may have a role in not just basic aspects of ASD, but also vulnerability to various chronic and systemic issues, such as cancer, metabolic abnormalities, and heart disease. [Wen, 2016](#).

Exposure to electromagnetic radiation may trigger epigenetic changes in the neurological system, which can lead to neurodegenerative illnesses like autism. [Ahuja, 2013](#).

The usage of cell phones by children is especially alarming since their thinner craniums allow RF waves from cell phones to reach brain tissue more easily than in adults. [Rosenberg, 2013](#).

According to studies, children who used cell phones or were exposed to wireless radiation during the perinatal period were more likely to suffer from headaches. [Sudan, 2012](#).

Teens

Research indicated that smartphone use significantly increases the risk of breast cancer and proximity of smartphone to breasts can lead to more negative effects [\(Shih et al., 2020\)](#).

Mobile phones and other wireless devices have the potential to have negative health consequences for young people; wireless technology exposure has been linked to several neurodevelopmental and neurobehavioral abnormalities, with epigenetic drivers and genetic (DNA) damage presumably playing a role. [Sage, 2018](#).

Wireless Expert Recommendations

American Academy of Pediatrics

American Academy of Pediatrics comment on the Proposed Rule “Reassessment of Exposure to Radiofrequency Electromagnetic Fields Limits and Policies” published in the Federal Register on June 4, 2013, requesting the FCC (Federal Communications Commission) to reassess impact of EMF radiation on children citing 3 reasons:

- 1) *Protect children’s health and well-being.* Children are not little adults and are disproportionately impacted by all environmental exposures, including cell phone radiation. Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children. It is essential that any new standard for cell phones or other wireless devices be based on protecting the youngest and most vulnerable populations to ensure they are safeguarded throughout their lifetimes.
- 2) *Reflect current use patterns.* The FCC has not assessed the standard for cell phone radiation since 1996. Approximately 44 million people had mobile phones when the standard was set; today, there are more than 300 million mobile phones in use in the United States. While the prevalence of wireless phones and other devices has skyrocketed, the behaviors around cell phone uses have changed as well. The number of mobile phone calls per day, the length of each call, and the amount of time people use mobile phones has increased, while cell phone and wireless technology has undergone substantial changes. Many children, adolescents and young adults, now use cell phones as their only phone line and they begin using wireless phones at much younger ages. Pregnant women may carry their phones for many hours per day in a pocket that keeps the phone close to their uterus. Children born today will experience a longer period of exposure to radio-frequency fields from cellular phone use than will adults, because they start using cellular phones at earlier ages and will have longer lifetime exposures. FCC regulations should reflect how people are using their phones today.
- 3) *Provide meaningful consumer disclosure.* The FCC has noted that it does not provide consumers with sufficient information about the RF exposure profile of individual phones to allow consumers to make informed purchasing decisions. The current metric of RF exposure available to consumers, the Specific Absorption Rate, is not an accurate predictor of actual exposure. AAP is supportive of FCC developing standards that provide consumers with the information they need to make informed choices in selecting mobile phone purchases, and to help parents to better understand any potential risks for their children. To that end, we support the use of metrics that are specific to the exposure children will experience [AAP 2013](#).

Government guidelines

International Commission on Non-Ionizing Radiation Protection

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) presents its principles for preventing adverse health effects from non-ionizing radiation exposure. [ICNIRP \(pp.477–482\), 2020](#).

The radiofrequency EMF section of the 1998 Guidelines has been updated by ICNIRP; this document presents the revised Guidelines, which protect humans from EMF exposure ranging from 100 kHz to 300 GHz. [ICNIRP \(pp.483-524\), 2020](#).

A review of the literature was conducted to identify potentially relevant knowledge gaps, and the goal of this statement is to describe data gaps in research that, if addressed, would aid ICNIRP in further developing guidelines and setting revised recommendations on limiting exposure to electric and magnetic fields; it is divided into two

sections: the main document, which reviews the science of low frequency data gaps, and the annex, which explains the methodology used to identify the data gaps. [ICNIRP \(pp.533-542\), 2020.](#)

In 2013, The International Commission on Non-Ionizing Radiation Protection (ICNIRP) issued guidelines on exposure limits for laser radiation with wavelengths ranging from 180 nm to 1,000 mm . Since then, the limits' application has revealed that some additional guidance is required for complex exposure cases. [ICNIRP \(pp.543-548\), 2020.](#)

BALANCED TECHNOLOGY MANAGEMENT INITIATIVES

Homes

Homes and families

Adolescents in the intervention group did not show statistically significant changes in media rule engagement after completing a family media use plan. [Moreno, 2021.](#)

The *Media Sensory Curation Theory* considers media devices as instruments that humans employ to preserve sensory management by capturing and curbing sensory input in both constructed and natural surroundings; general sensory processing and media sensory curation have a moderate to strong relationship. [Harrison, 2019.](#)

30% of parents place at least one electronic device in their children's bedrooms associated with lower overall school readiness and social competence. Harmful effect was more prominent among lower socioeconomic families and could be partially alleviated with parental restriction. [Fu 2017.](#)

A four-week plan to reduce meltdowns, improve grades, and improve social skills by reversing the impacts of electronic screen usage. [Dunckley, 2015.](#)

Parental media monitoring has a protective effect on many different educational, social and physical outcomes of children. [Gentile, 2014.](#)

The *Fourth R Parent Media Violence Workshop* was created to teach parents about the need of setting boundaries for their children's media intake and to encourage parents to take care on their children's media consumption; following the training, parents implemented more stringent, appropriate restraints, and active monitoring methods. [Broll, 2013.](#)

Around 17% of teenagers had real-life interactions with online contacts, while 30% of their parents were unaware of it. [Van den Heuvel, 2012.](#)

This research examined the connections between information seeking, parental worries, threats children have faced, and access to connected devices, as well as the use and satisfaction with various digital safety tools. [Davis, 2012.](#)

Parental involvement

Parental communication about media use that supports autonomy is associated with fewer concealments of media use by young people. [Kroshus, 2021.](#)

When parents spend time with their children, smartphones can distract them from feeling a sense of social

connection. According to these studies, having a constant Internet connection may have unnoticed consequences for the fabric of social life. [Kushlev, 2018.](#)

Parental media monitoring has a protective effects on many different academic, social, and physical outcomes. [Gentile, 2014.](#)

Family Organization, Parental Support, and Parental Limiting were found to be significantly related to the dimensions of the children's executive functions. [Schroeder, 2010.](#)

Raising Parents book offers a systematic analysis of parental behaviour as well as methods for recognising and correcting poor parenting. [Crittenden, 2008.](#)

The amount of time parents spend linked to various forms of technology prevents them from building healthy, primary relationships with their children. [Flores, 2004.](#)

Support network

"*Refuse to Use*" is a global movement led by responsible and forward-thinking parents and teachers who want to ban all school-based technology for children under the age of 12 and replace it with tried-and-true teaching techniques. [Rowan, 2014.](#)

Schools

Schools of Tomorrow Edition XII conference titled A World of Tomorrow: From Darkness to Light. Session title: Keeping Creativity Alive: A Tribute to Sir Ken Robinson. Panel discussion with Cris Rowan, Prof Dr Ger Graus, Lord Jim Knight, Lee Daley and Afshan Khalid. Date: 20 Nov 2020. [SOT Events, 2021.](#)

Screen management policy

In children and adolescents, screen time use has increased at an unprecedented rate, which has resulted in a variety of physical and psychological disorders that were virtually unheard of in previous generations; the time has come to actively challenge those systemic processes that initiate, encourage, and promote screen use in light of the vast body of scientific evidence demonstrating the wide range of pathology brought on by prolonged screen use. [Stolzer, Biocultural Analysis, 2021.](#)

This article on digital screens, apps and books is an invitation to further research into the role of digital content in the early development of literacy and provides "alerts" to further explore more the hidden potentials of new technologies and how routines such as book reading might change and become more effective in some respects. [Bus, 2020.](#)

With researchers advocating for increased services for children to address the rising prevalence of child mental illnesses, [McEwan, 2007,](#) and solid evidence that many of these disorders may be linked to technology overuse, it appears that routine technology screening and management programs should be implemented in the health and education sectors. [Rowan, 2010.](#)

"*Below C Level*" is a path for educational success from a veteran PBS and NPR reporter. The author describes the difficulties facing the American people and offers insightful analysis and solutions as he discusses teaching and learning from kindergarten to prison. [Merrow, 2010.](#)

Moderate use of digital technology for less than 2.5 hours a day is not inherently harmful and can be beneficial in a connected world. [Przybylski, 2017.](#)

Increased exposure to internet hazards was linked to children's online activity. [Lee SJ, 2012.](#)

Screens in schools

According to a parent survey, children's behavioural outcomes were worse during distant schooling than in-person schooling, with hybrid learning falling somewhere in the middle, i.e. better than remote but worse than in-person. [Hanno, 2022.](#)

NAEP study results showed from 2019-2022 for math: the largest deterioration in math achievement on record (5 points in grade 4, 8 points in grade 8) and for reading; 3-point reading slump same grades. "If left unaddressed, the life trajectories and opportunities of a whole cohort of young people could be permanently altered" NAEP. [National Assessment of Educational Progress, 2022.](#)

The study found that distance education has a detrimental influence on the mental health of students who exhibit depressive symptoms as well as difficulties with concentration and learning, which are the strongest predictors of poor academic achievement. [Giusti, 2021.](#)

Survey of 663 schools in all 50 states indicates that 96% of K-12 school apps share children's personal information with third parties, 78% of the time with advertising and data analytics entities without the knowledge or consent of the users or the schools, making them unsafe. [Internet Safety Labs, 2021.](#)

Results show that handwriting (compared with typing) produce faster learning and greater generalization to untrained tasks. Furthermore, only handwriting practice leads to learning of both motor and symbolic letter representations thus improving reading skill. [Wiley, 2021.](#)

It is high time to address why children spend too much time with screens in schools and how screen time use creates indirect media effects. [Montag, 2020.](#)

On average, edtech developer research showed improvements in test scores that were 70 percent greater than what independent studies found. [Barshay, 2019.](#)

The Canadian 24-Hour Movement Guidelines for Children and Youth recommend at least 60 min physical activity/day, < 2 hrs recreational screen time/day, and 9–11 hrs. sleep per night in children aged 8–11 years all associated with superior global cognition. [Walsh, 2018.](#)

Additional research is needed on the role of information processing in screen-based learning for young children. [Kirkorian, 2017.](#)

Research review showed better comprehension outcomes with print rather than with digital texts. The research attributes this to the disruptive effect of scrolling on screens. [Singer, 2017.](#)

In countries that have substantially invested in ICT for education, there have been no discernible gains in student achievement in reading, mathematics, or science. [OECD, 2015.](#)

Internet searches are performed more hastily with more difficulty recollecting search data in comparison to non-Internet-based searching e.g. encyclopedias. [Dong, 2015.](#)

Students who read texts in print scored significantly better on the reading comprehension test than students who read the texts digitally. [Mangen, 2013.](#)

Teachers on average teach handwriting 13 min. per day in primary grades. [Graham, 2008.](#)

Outdoor Schools

Study reports that children who play freely in the great outdoors are healthier in body and mind and active engagement with the natural environment reduces stress and relieves depression in all ages. Article recommends physicians prescribe outdoor play for children. [Bravender, 2020.](#)

Rural children are less sedentary and more physically active than urban children. [McCrorie, 2020.](#)

Covid-19 Outdoor Learning. Green Schoolyards America has put together a website for schools with focus on how to create outdoor schools to accommodate Covid-19 guidelines. Included are radio interviews, webinars, and handouts. [Green Schoolyards America.](#)

Exposure to green spaces can improve prosocial behavior in children and adolescents. [Putra, 2020.](#)

Nature exposure improves academic performance, personal growth, and environmental responsibility. [Kuo, 2019.](#)

Access to green spaces in or around workplaces increases work productivity as improves physical and mental health. Provision of structural and loose play equipment after a period of 6 months resulted in a 23.3% increase in children engaging in *moderate to vigorous* physical activity during recess and 26.2% increase in children engaged in *vigorous* physical activity. These increases were sustained at 1 year from baseline, with an increase of additional 17.2% for *moderate to vigorous* physical activity and 33.1% for *vigorous* physical activity. [Frost, 2018.](#)

The prevalence of ADHD, and thus the need for psychostimulant medications in growing children, may be reduced if we create play sanctuaries for preschool children, where they can play naturally with each other, facilitating frontal lobe maturation and the healthy development of pro-social minds. [Panksepp, 2008.](#)

Physical exercise is linked to seven different types of cognitive performance: perceptual skills, intelligence quotient, achievement, verbal tests, math tests, developmental level, and academic readiness. [Ratey, 2008.](#)

In both areas of impulse control and attention capacity, exposure to "green space" leads in a considerable reduction in ADHD. Nature not only helps with attention, but it also stimulates all of the senses, which helps with multi-sensory learning. [Taylor, 2001.](#)

Playground safety

More than 200,000 children are treated in hospital emergency rooms in the United States each year for injuries caused by playground equipment; the Public Playground Safety Checklist provides practical advice on how to make the local community or school playgrounds a safe place to play. [US Consumer Product Safety Commission.](#)

Environmental modifications minimize injuries by 50-75%, playgrounds can be built to be safe. [Howard, 2010.](#)

The Canadian Standards Association establishes playground guidelines and, if followed, reduce injury rates by half. [Howard, 2005.](#)

Falling from playground equipment is one of the risk factors for serious playground injuries; falling from a height of more than 1.5 meters onto an inadequate falling surface causes the majority of playground injuries. [Macarthur, 2000.](#)

Clinics

Mandatory screening for screen use

The author of this commentary recommends routine screening for abuse and neglect in children who present with mental illness. [Gordon, 2020](#).

Parent education

Unplug – don't drug

Overuse of technology may result in child behavior diagnosis and subsequent use of psychiatric medication; the unique "Unplug – don't drug" policy initiative and routine technology screening highlights issues of concern for parents, family physicians, and offers a novel treatment approach. [Rowan, 2010](#).

Government

Great need for more research demonstrating government initiatives to reverse the escalating trend of screen overuse.

Municipal (subsidized pools, gyms, events)

Provincial/State (free access to parks, beaches, forests)

Federal (educate, legislate, regulate tech giants; turn off internet for 8 hours during night)

In an effort to resolve the problem of escalating child internet addictions, the South Korean government has initiated the Jump Up Internet Rescue School, a camp designed to treat Internet-addicted or online game-addicted children. [Koo, 2010](#).

Researchers

Results showed that associations vary as a function of when digital technologies are used (i.e., weekday vs. weekend), suggesting that a full understanding of the impact of these recreational activities will require examining their functionality among other daily pursuits. Overall, the evidence indicated that moderate use of digital technology is not intrinsically harmful and may be advantageous in a connected world. [Prybylski, 2017](#)

Technology Production Corporations

Tech giants must be held accountable and make reparations for damage caused by screen overuse.

Do no harm

Urgent need for Best Practice Guidelines for technology production to ensure children, youth and adult safety.

Warnings on products

Probable physical, social, emotional, mental and cognitive impairments.

Age limit enforcement

Funding provided for government initiatives for screen reduction



WORKPLACE ERGONOMICS

Nature

Nature exposure improves academic performance, personal growth, and environmental responsibility. [Kuo, 2019](#).

Synthesis suggested that passive nature exposure promotes positive changes in attention, memory and mood. [Norwood, 2019](#).

It has been proven that spending at least 120 minutes per week in nature improves health and well-being. [White, 2019](#).

These findings suggest that greenspace has a positive impact on a variety of health outcomes. [Twohig-Bennett, 2018](#).

Access to green spaces in or around workplaces increases work productivity as improves physical and mental health.

Ergonomic Musculoskeletal Injury Prevention

WorkSafe BC. 2022. [Handle with Care – Patient Handling and the Application of Ergonomic \(MSI\) Requirements](#). Free download retrieved from www.worksafefbc.com, April 2023.

WorkSafe BC. 2022. [Preventing Musculoskeletal Injury – A guide for employers and joint committees](#). Free download retrieved from www.worksafefbc.com, April 2023.

WorkSafe BC. 2022. [Understanding the Risk of Musculoskeletal Injury \(MSI\) – An educational guide for workers on sprains, strains and other MSI's](#). Free download retrieved from www.worksafefbc.com, April 2023.

Productivity and Breaks

In order to preserve or improve upon employee well-being and work performance, breaks are necessary to recover from work demands, prevent burn-out and create a positive work-environment [Lyubykh et al., 2022](#).

More frequent universal-type work breaks yield positive effects on both employee health and performance in stressful work environments and increase overall job satisfaction [Scholz et al., 2018](#).

Building in frequent work breaks for highly demanding occupations have a significant impact on overall mood, cognitive performance and neurophysiological state when compared to those who also work in highly demanding work environments without frequent breaks [Scholz et al., 2018](#).

Even when people manage to maintain constant attention - for example, avoiding the temptation to check phones – merely having these devices nearby diminishes available cognitive capacities; furthermore, people who are the most addicted to smartphones face the biggest cognitive consequences. [Ward, 2017](#).

Within small worksite environments, frequent shorter work breaks and stretching exercises improved productivity, eye, leg and foot comfort [Henning et al., 1997](#).

Posture

Single case of headache from using digital device resolved with deep breath and posture reset exercise. [Peper, 2021](#).

Seventy-five percent of the participants reported some level of either chronic or acute back pain. Individuals with chronic LBP demonstrated a trend towards more static sitting behaviour compared to their pain-free counterparts. A greater association was found between sitting behaviour and chronic LBP than for acute pain/disability. [Bontrupa 2019](#).

Study found that using a smartphone for more than 4 hours a day can have a negative impact on posture and lung function. [Jung, 2016](#).

The forces on the cervical spine increase gradually as the neck is in forward flexion, as is often the case with the use of smartphones. [Hansraj, 2014](#).

Postures utilized while holding mobile devices such as holding a phone vs texting are believed to impact muscle and thumb positions ([Gustafsson, Johnson & Hagberg, 2010](#)).

When texting, female exhibit higher muscle activity in the extensor digitorum and the abductor pollicis longus; also having greater thumb abduction and fewer pauses in thumb movements ([Gustafsson, Johnson & Hagberg, 2010](#)).

Exercise and Fitness

[Canada 24-Hour Movement Guidelines](#). 2022. Retrieved from www.csepguidelines.ca on April 11, '23.

Mental Illness

In any given year, 1 in 5 people in Canada will personally experience a mental health problem or illness and by age 40, about 50% of the population will have or have had a mental illness. [Canadian Mental Health Association 2023](#).

Increased opportunities for interpersonal interactions at work through greater task interdependence are not enough to reverse the negative effects of workplace isolation on wellbeing. In contrast, an investment in a supportive environment may reverse the negative effects of workplace isolation on wellbeing, highlighting the importance of a supportive culture. [D'Oliveira 2023](#).

Work-life balance was highest in the flexible standard and rigid standard schedules and lowest in schedules with high working time demands, namely the extended shift, rigid all-week, and rigid extended schedules. Employees with high working time demands and low control represent risk groups prone to impairments of well-being [Brauner C. 2019](#).

Psychiatric Drugs informs law enforcement, legislators, policymakers, healthcare professionals, and educators about the risks of psychotropic drugs causing violent, illogical, and suicidal conduct, as well as the severe side effects of withdrawal. [Eastgate, 2018](#).

Brain structural changes related to cognitive control and emotional regulation are associated with digital media addictive behavior. Screen time induced adhd-related behavior could be inaccurately diagnosed as adhd. Screen time reduction is effective in decreasing adhd-related behavior. [Lissak, 2018](#).

More than four out of five adults in the United States say they check their email, messages, and social media accounts frequently or continuously a decade after cellphones, Facebook, and Twitter were introduced, resulting in higher stress levels for these Americans. [APA, 2017](#).

Technology Overuse

Gaming disorder is characterized by impaired control over gaming, increasing priority given to gaming over other activities to the extent that gaming takes precedence over other interests and daily activities, and continuation or escalation of gaming despite the occurrence of negative consequences. ([WHO, 2022](#))

Internet Use Disorder is a rapidly growing behavioural addiction; this condition has been linked to a number of structural and functional brain changes. [Darnai, 2022.](#)

Risky game users reported lower levels of happiness and satisfaction, as well as a significantly higher lifetime prevalence of major depressive disorder, alcohol dependence, and suicidal ideation; usual game players had a significantly higher lifetime prevalence of alcohol dependence and suicidal ideation. [Byeon, 2022.](#)

Short-term abstinence from gaming that is intentional and under control reduces Internet Gaming Disorder and improves mental health. [Brailovskaia, 2022.](#)

Among Internet Gaming Disorders, the five most commonly reported health-related variables are depression (67 times), internet addiction (54 times), anxiety (48 times), impulsivity (37 times), and attention deficit hyperactivity disorder (24 times). [Darvesh, 2020.](#)

During the Covid-19 pandemic, Pornhub, one of the largest porn sites, saw porn use spike in many countries, with global traffic gaining more than 11%. [Mestre-Bach, 2020.](#)

Long-term internet pornography use resulted in erectile dysfunction and delayed ejaculation. [Park, 2016.](#)

Twitter usage leads to increased Twitter-related disagreements between intimate partners, which leads to infidelity, breakup, and divorce. [Clayton, 2014.](#)

A high amount of Facebook usage has been linked to poor relationship results. [Clayton, 2013.](#)

Communication quality in intimate relationships is significantly better in the Second-Life relationships than in 3D life and level of satisfaction is higher with virtual partners. [Gilbert, 2011.](#)

RESEARCH REFERENCES (over 400 in total)

Ahuja YR, Sharma S, Bahadur B. 2013. [Autism: An epigenomic side-effect of excessive exposure to electromagnetic fields.](#) *International Journal of Medical Sciences.* 5(4);171-177.

Aldad T, Gan G, Gao XB. 2012. [Fetal radiofrequency radiation exposure from 800-1900 MHz-rated cellular telephones affects neurodevelopment and behavior in mice.](#) *Scientific Reports.* 2(312);1-7.

Allen, C. T., Ridgeway, R., & Swan, S. C. (2015). [College students' beliefs regarding help seeking for male and female sexual assault survivors: Even less support for male survivors.](#) *Journal of Aggression, Maltreatment & Trauma,* 24, 102-115.

Almuaigel D, Alanazi A, Almuaigel M, et al. 2021. [Impact of technology use on behavior and sleep scores in preschool children in Saudi Arabia.](#) *Front Psychiatry.* 12;649095.

American Academy of Pediatrics. 2016. [Policies on Children and Media.](#) Retrieved from www.aap.org on May 31, '23.

American Academy of Pediatrics. 2016. [Virtual Violence.](#) Retrieved from www.aap.org on May 31, '23.

American Psychological Association. 2020. [APA Resolution on Violent Video Games.](#) Retrieved from www.apa.org on May 31, '23.

- American Psychological Association. 2019. [Mental Health Issues Increased Significantly in Young Adults Over Last Decade](#). *Mental Health*.
- American Psychological Association. February 23, 2017. [APA's survey finds constantly checking electronic devices linked to significant stress for most Americans](#). Press Releases. *American Scientist*. 99(4);301.
- Anderson CA, Shibuya A, Ihori N. 2010. [Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: a meta-analytic review](#). *Psychology Bulletin*. 136(2);151-73.
- Anderson C, Gentile D, Buckley KE. 2007. [Violent video game effects on children and adolescents: theory, research, and public policy](#). Oxford University Press.
- Anderson CA, Berkowitz L, Donnerstein E, et al. 2003. [The influence of media violence on youth](#). *Psychological Science in the Public Interest*. 4(3);81-110.
- Anderson CA, Sakamoto A, Gentile DA, et al. 2008. [Longitudinal effects of violent video games on aggression in Japan and the United States](#). *Pediatrics*. 122(5);1067-1072.
- Anderson CA. 2014. [Violent, nonviolent, and prosocial gaming effects on teens' civic engagement](#). *Oxford University Press. Oxford Handbooks Online*. pp.1-22.
- Anderson M. September 27, 2018. [A majority of teens have experienced some form of cyberbullying](#). PEW Research Center.
- Ardiel EL, Rankin CH. 2010. [The importance of touch in development](#). *Paediatric Child Health*. 15(3);153-156.
- Aris IM, Block JP. 2022. [Childhood obesity interventions—going beyond the individual](#). *JAMA Pediatr*. 176(1):e214388.
- Avendano C, Mata A, Sanchez Sarmiento CA, et al. 2012. [Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation](#). *Fertility and Sterility*. 97(1);39-45.
- Balakrishnan J, Griffiths MD. 2018. [An exploratory study of "Selfitis" and the development of the selfitis behavior scale](#). *International Journal of Mental Health and Addiction*. 16(2018);722–736.
- Bannett Y, Gardner RM, Posada J, et al. 2022. [Rate of pediatrician recommendations for behavioral treatment for preschoolers with attention-deficit/hyperactivity disorder diagnosis or related symptoms](#). *JAMA Pediatr*. 176(1);92-94.
- Baranek GT, David FJ, Poe MD, et al. 2006. [Sensory Experiences questionnaire: discriminating sensory features in young children with autism, developmental delays, and typical development](#). *Journal of Child Psychology and Psychiatry*. 47(6);591–601.
- Baranowski T, Abdelsamad D, Baranowski J, et al. 2012. [Impact of an active video game on healthy children's physical activity](#). *Pediatrics*. 129(3);636–642.
- Baron-Cohen S. Atypical sensory functioning in autism spectrum conditions. Research in progress at Autism Research Center, Cambridge, UK. <https://www.autismresearchcentre.com/research/project.asp?id=3> this link doesn't exist anymore.
- Barr R, Lauricella AR, Zack E, et al. 2010. [The relation between infant exposure to television and executive functioning, cognitive skills, and school readiness at age four](#). *Merrill-Palmer Quarterly*. 56(1);21–48.
- Barros RM, Silver EJ, Stein REK. 2009. [School recess and group classroom behavior](#). *Pediatrics*. 123(2);431-436.

- Barshay J. 2019. [The darker side of education research: Widespread bias](#). The Hechinger Report.
- Bas O, Odaci E, Mollaoglu H. 2009. [Chronic prenatal exposure to the 900 megahertz electromagnetic field induces pyramidal cell loss in the hippocampus of newborn rats](#). *Toxicology and Industrial Health*. 25(6);377-84.
- Bass A. 2009. [Side effects: a prosecutor, a whistleblower, and a bestselling antidepressant on trial](#). (1st. ed.) Algonquin Books, Workman Publishing Company.
- Bastug, M. F., Douai, A., & Akca, D. (2020). Exploring the “Demand Side” of Online Radicalization: Evidence from the Canadian Context. *Studies in Conflict and Terrorism*, 43(7), 616–637.
- Baughman F. 2006. [There is no such thing as a psychiatric disorder/disease/chemical imbalance](#). *PLoS medicine*. 3(7);318.
- Becker MW, Alzahabi R, Hopwood CJ. 2013 [Media multitasking is associated with symptoms of depression and social anxiety](#). *Cyberpsychology, Behavior, and Social Networking*. 16(2);132-135.
- Belkin D. 2021, September 6. [A generation of American men give up on college: 'I just feel lost'](#). *The Wall Street Journal*. National Student Clearinghouse.
- Belkin D. 2021. [A generation of American men give up on college: 'I just feel lost'](#). *The Wall Street Journal*.
- Beltrán S, Sit L, Ginsburg KR. 2021. [A call to revise the diagnosis of oppositional defiant disorder—diagnoses are for helping, not harming](#). *JAMA Psychiatry*. 78(11);1181-1182.
- Ben-Sasson A, Carter AS, Briggs-Gowan M. 2010. [The development of sensory over-responsivity from infancy to elementary school](#). *Journal of Abnormal Child Psychology*. 38(8);1193-1202.
- Bermingham, A., Conway, M., McInerney, L., O’Hare, N., & Smeaton, A. . (2009). Combining Social Network Analysis and Sentiment Analysis to Explore the Potential for Online Radicalisation. *2009 International Conference on Advances in Social Network Analysis and Mining*, 231–236.
- Bethell C, Jones J, Gombojav N, et al. 2019. [Positive childhood experiences and adult mental and relational health in a statewide sample: associations across adverse childhood experiences levels](#). *JAMA Pediatrics*. 173(11);e193007.
- Beullens K, Roe K, Van den Bulck J. 2011. [Excellent gamer, excellent driver? The impact of adolescents' video game playing on driving behavior: a two-wave panel study](#). *Accid Anal Prev*. 43(1);58-65. This link or website doesn't work today, maybe the website issues.
- Beutel ME, Brähler E, Glaesmer H, et al. 2011. [Regular and problematic leisure-time internet use in the community: results from a German population-based survey](#). *Cyberpsychology, Behavior, and Social Networking*. 14(5);291-296.
- Bigelow AE, Power M. 2020. [Mother–infant skin-to-skin contact: short- and long-term effects for mothers and their children born full-term](#). *Front. Psychology*. 11(1921);1-9.
- Bioinitiative Working Group. 2014. [Reported biological effects from radiofrequency radiation at low-intensity exposure \(cell tower, Wi-Fi, wireless laptop and 'smart' meter RF intensities\)](#). Pages 1-11.
- Blad E. 2019. [Schools grapple with student depression as data show problem worsening](#). *Education Week*. Student well-being.

- Boers E, Afzali MH, Newton N, et al. 2019. [Association of screen time and depression in adolescence](#). *JAMA Pediatr.* 173(9);853–859.
- Bontrupa C et. al. 2019. [Low back pain and its relationship with sitting behaviour among sedentary office workers](#). *Applied Ergonomics*. Nov;81:102894.
- Bouffard S et. al. 2021. [Social Media and Romantic Relationship: Excessive Social Media Use Leads to Relationship Conflicts, Negative Outcomes, and Addiction via Mediated Pathways](#). *Social Science Computer Review*. Vol 40, Issue 6.
- Brailovskaia J, Meier-Faust J, Schillack H, et al. 2022. [A two-week gaming abstinence reduces Internet Gaming Disorder and improves mental health: An experimental longitudinal intervention study](#). *Computers in Human Behavior*. 134;107334
- Braithwaite SR, Coulson G, Keddington K. 2014. [The influence of pornography on sexual scripts and hooking up among emerging adults in college](#). *Arch Sex Behav*. 44(1);111-123.
- Brand M, Young KS, Laier C. 2014. [Prefrontal control and Internet addiction: a theoretical model and review of neuropsychological and neuroimaging findings](#). *Human Neuroscience*. 8(375);1-13.
- Brandom, R. July 22, 2019. [Facebook design flaw let thousands of kids join chats with unauthorized users](#). The Verge.
- Brasel SA, Gips J. 2011. [Media multitasking behavior: concurrent television and computer usage](#). *Cyberpsychology, Behavior, and Social Networking*. 14(9);527-534.
- Braswell J, Rine RM. 2006. [Evidence that vestibular hypofunction affects reading acuity in children](#). *International Journal of Pediatric Otorhinolaryngology*. 70(11);1957-1965.
- Brauner C et. al. 2019. [Health and work-life balance across types of work schedules: A latent class analysis](#). *Applied Ergonomics*. 81, 102906.
- Bravender LS. 2020. [Nature play: A prescription for healthier children](#). *Contemporary Pediatrics*. 37(3), 12-22.
- Breggin P. 2008. [Medication madness: the role of psychiatric drugs in cases of violence, suicide and crime](#). St. Martin's Press.
- Broll R, Crooks CV, Burns S, et al. 2013. [Parental monitoring, media literacy, and rule setting after the Fourth R Parent Media Violence Workshop](#). *International Journal of Child, Youth and Family Studies*. 2(2013);301-319.
- Bryce J, Fraser J. 2013. ["It's common sense that it's wrong": young people's perceptions and experiences of cyberbullying](#). *Cyberpsychology, Behavior, and Social Networking*. 16(11);783-787.
- Burdette HL, Whitaker RC. 2005. [A national study of neighborhood safety, outdoor play, television viewing, and obesity in preschool children](#). *Pediatrics*. 116(3);657-662.
- Bus A, Roskos K, Neuman S. 2020. [Screens, apps, and digital books for young children: the promise of multimedia](#). *AERA Open*. 6(1);233285842090149.
- Bushnell GA, Crystal S, Olfson M. 2021. [Trends in antipsychotic medication use in young privately insured children](#). *Child and Adolescent Psychiatry*. 60(7);877-886.
- Byeon G, Park JE, Jeon HJ, et al. 2022. [Associations between game use and mental health in early adulthood: A nationwide study in Korea](#). *Journal of Affective Disorders*. 297;579-585.

- Byun S, Ruffini C, Mills JE. 2009. [Internet addiction: metasynthesis of 1996–2006 quantitative research](#). *Cyberpsychology and Behavior*. 12(2);203-207.
- Byun YH, Ha M, Kwon HJ, et al. 2013. [Mobile phone use, blood lead levels, and attention deficit hyperactivity symptoms in children: a longitudinal study](#). *Plos One Journal*. 8(3). 1-10.
- Calamaro CJ, Yang K, Ratcliffe S, et al. 2012. [Wired at a young age: the effect of caffeine and technology on sleep duration and body mass index in school-aged children](#). *Journal of Pediatric Health Care*. 26(4);276-282.
- Caldwell, H. A. T., Miller, M. B., Tweedie, C., Zahavich, J. B. L., Cockett, E., & Rehman, L. (2022). The Effect of an After-School Physical Activity Program on Children’s Cognitive, Social, and Emotional Health during the COVID-19 Pandemic in Nova Scotia. *International Journal of Environmental Research and Public Health*, 19(4), 2401.
- [Canada 24-Hour Movement Guidelines](#). 2022. Retrieved from www.csepguidelines.ca on April 11, '23.
- Canadian Centre for Child Protection, Child Sexual Abuse Images on the Internet: A Cybertip.ca Analysis. April 13, 2021. <https://www.protectchildren.ca/en/resources-research/child-sexual-abuse-images-report/>
- Canadian Mental Health Association. 2021. [Fast Facts About Mental Health and Mental Illness](#). Retrieved from www.cmha.ca on April 11, '23.
- Canadian Pediatric Society. 2017. [Screen time and young children: Promoting health and development in a digital world Canadian Paediatric Society, Digital Health Task Force, Ottawa, Ontario](#). *Paediatrics & Child Health*, Volume 22, Issue 8, December 2017, Pages 461–468, <https://doi.org/10.1093/pch/pxx123>.
- Captain Peter “UGH” Ryan. 2018. [Technology: the new addiction](#). *U.S. Naval Institute*. Proceedings.
- Carlson M, Earls F. 1997. [Psychological and neuroendocrinological sequelae of early social deprivation in institutionalized children in Romania](#). *Annals of the New York Academy of Sciences*. 807;419-428.
- Carnagey NL, Anderson CA, Bushman BJ. 2007. [The effect of video game violence on physiological desensitization to real-life violence](#). *Journal of Experimental Social Psychology*. 43(2007);489-496.
- Carson V, Pickett W, Janssen I. 2011. [Screen time and risk behaviors in 10- to 16-year-old Canadian youth](#). *Preventive Medicine*. 52(2);97-98.
- Carter B, Rees P, Hale L, et al. 2016. [Association between portable screen-based media device access or use and sleep outcomes: a systematic review and meta-analysis](#). *JAMA Pediatr*. 170(120);1202–1208.
- Carter SP, Greenberg K, Walker MS. 2017. [The impact of computer usage on academic performance: evidence from a randomized trial at the United States Military Academy](#). *Economics of Education Review*. 56(2017);118-132.
- CBC News by Nono Shen on May 6, '23. [Teachers say BC teens showed improved grades and social skills after a ban on phones](#). Retrieved on May 11, '23.
- Center for Countering Digital Hate | CCDH. The Incelosphere. (2022, July). Retrieved from <https://counterhate.com/wp-content/uploads/2022/09/CCDH-The-Incelosphere..pdf>
- Center for Disease Control. Feb. 2022. [Youth Risk Behavior Survey – Data Summary and Trends Report](#). 57% of teen girls say they experience persistent sadness or hopelessness (up from 36% in 2011) and 30% of teen girls say they have seriously considered suicide (up from 19% in 2011).

- Centre for Disease Control and Prevention. September 2, 2005. [Mental Health in the United States: Prevalence of Diagnosis and Medication Treatment for Attention-Deficit/Hyperactivity Disorder - United States, 2003](#). *MMWR Weekly*. 54(34);842-847.
- Chamorro E, Bonnin-Arias C et. Al. 2013. [Effect of Light-emitting Diode Radiations on Human Retinal Pigment Epithelial Cells *In Vitro*](#). *Photochemistry and Photobiology*. 89:468-473.
- Chen P, Lai Z et. Al. 2019. [Retinal Neuron Is More Sensitive to Blue Light-Induced Damage than Glia Cell Due to DNA Double-Strand Breaks](#). *Cells*, Vol 8(1):68.
- Cheslack-Postava K, Liu K, Bearman PS. 2011. [Closely spaced pregnancies are associated with increased odds of autism in California sibling births](#). *Pediatrics*. 127(2);246–253.
- Chiu SI, Lee JZ, Huang DH. 2004. [Video game addiction in children and teenagers in Taiwan](#). *Cyberpsychology and Behavior*. 7(5);571-581.
- Choliz M, Marco C. 2011. [Pattern of Use and Dependence on Video Games in Infancy and Adolescence](#). *Anales de Psicología*. 27(2);418-426.
- Chonchaiya W, Sirachairat C, Vijakkhana N, et al. 2015. [Elevated background TV exposure overtime increases behavior scores of 18-month-old toddlers](#). *Foundation Acta Paediatrica*. 104(10);1039-1046.
- Christakis DA, Gilkerson J, Richards JA, et al. 2009. [Audible television and decreased adult words, infant vocalizations, and conversational turns: a population-based study](#). *Archives of Pediatrics & Adolescent Medicine*. 163(6);554-558.
- Christakis DA, Van Cleve W, Zimmerman FJ. 2020. [Estimation of US children’s educational attainment and years of life lost associated with primary school closures during the coronavirus disease 2019 pandemic](#). *JAMA Netw Open*. 3(11);e2028786.
- Christakis DA, Zimmerman FJ, DiGiuseppe DL, et al. 2004. [Early television exposure and subsequent attentional problems in children](#). *Pediatrics*. 113(4);708-713.
- Christakis DA, Zimmerman FJ. 2007. [Violent television viewing during preschool is associated with antisocial behavior during school age](#). *Pediatrics*. 120(5): 993-999.
- Christakis DA. 2011. [The effects of fast-paced cartoons](#). *Pediatrics*. 128(4);772 -774.
- Chu J, Ganson KT, et. Al. 2023. [Screen time and suicidal behaviors among U.S. children 9-11 years old: A prospective cohort study](#). *Preventive Medicine*. Vol 169. 107452.
- Chun J, Shim H, Kim S. 2017. [A meta-analysis of treatment interventions for internet addiction among Korean adolescents](#). *Cyberpsychology, Behavior and Social Networking*. 20(4);225-231.
- Clayton RB, Nagurney A, Smith JR. 2013. [Cheating, breakup, and divorce: is Facebook use to blame?](#) *Cyberpsychology, Behavior, and Social Networking*. 16(10);717-720.
- Clayton RB. 2014. [The third wheel: the impact of Twitter use on relationship infidelity and divorce](#). *Cyberpsychology, Behavior, and Social Networking*. 17(7);425-430.
- Clegg F. EMFs & Dirty Electricity: [Invisible threat. The link between wireless radiation and a host of serious illnesses](#).

Retrieved from <https://vitalitymagazine.com/article/invisible-threat/> on February 4, 2014. It's not a research, but maybe you want to keep it?

Cohen DA, Marsh T, Williamson S, et al. 2012. [Impact and cost-effectiveness of family Fitness Zones: a natural experiment in urban public parks](#). *Health Place*. 18(1);39-45. Committee on Communications. 2006. [Children, adolescents and advertising](#). *American Academy of Pediatrics*. 118(6);2563-2569.

Collins RL, Strasburger VC et. Al. 2017. [Sexual Media and Childhood Well-being and Health](#). *Pediatrics*. 140:S162-S166.

Committee on Public Education. 2001. [American Academy of Pediatrics: children, adolescents, and television](#). *American Academy of Pediatrics*. 107(2);423-426.

Common Sense Media. 2016. [New Report Finds Teens Addicted to Their Phones, Causing Tension at Home](#). Retrieved on May 11, '23.

Common Sense Media. 2022. [Teens and Porn](#). Retrieved on April 1, '23.

Conners-Burrow NA, McKelvey LM, Fussell JJ. 2011. [Social outcomes associated with media viewing habits of low-income preschool children](#). *Early Education and Development*. 22(2);256-273.

Conrod PJ, O'Leary-Barrett M, Newton N, et al. 2013. [Effectiveness of a selective, personality-targeted prevention program for adolescent alcohol use and misuse: a cluster randomized controlled trial](#). *JAMA Psychiatry*. 70(3);334-342.

Council on communication and media: Strasburger VC, Hogan MJ, Mulligan DA, et al. 2013. [Children, adolescents and the media](#). *American Academy of Pediatrics*. 132(5);958-961.

Council on communications and media: Christakis D, Hill D, Ameenuddin N, et al. 2016. [Virtual Violence](#). *American Academy of Pediatrics*. 138(2);e20161298.

Coureau G, Bouvier G, Lebaillly P, et al. 2014. [Mobile phone use and brain tumors in the CERENAT case-control study](#). *Occupational and Environmental Medicine*. 71(7);514-522.

Coyne SM, Shawcroft J, Gale M, et al. 2021. [Tantrums, toddlers and technology: temperament, media emotion regulation, and problematic media use in early childhood](#). *Computers in Human Behavior*. 120;106762.

Coyne SM, Stockdale LA, Nelson DA, et al. 2011. [Profanity in media associated with attitudes and behavior regarding profanity use and aggression](#). *Pediatrics*. 128(5);867-872.

Crane L, Goddard L, Pring L. 2009. [Sensory processing in adults with autism spectrum disorders](#). *Autism*. 13(3);215-228.

Crittenden PM. 2008. [Raising Parents: Attachment, Parenting and Child Safety](#). Willan Publishing.

Crofton K. 2011. [Wireless radiation rescue: safeguard your family from electro-pollution](#). *Global Wellbeing Books*.

Cummins RA. 1991. [Sensory integration and learning disabilities: Ayres' factor analyses reappraised](#). *J Learn Disabil*. 24(3);160-168.

Currie J, Stabile M, Jones L. 2014. [Do stimulant medications improve educational and behavioral outcomes for children with ADHD?](#) *J Health Econ*. 37;58-69.

Cyberpsychology, Behavior and Social Networking. 14(7-8);447-451.

Cyberbullying Research Center. [Cyberbullying Facts](#). Retrieved on May 11, '23.

Czeisler CA, Shanahan TL. 2016. [Problems associated with use of mobile devices in the sleep environment—streaming instead of dreaming](#). *JAMA Pediatrics*. 170(12);1146–1147.

Darnai G, Perlaki G, Orsi G, et al. 2022. [Language processing in Internet use disorder: task-based fMRI study](#). *PLoS One*. 17(6);0269979.

Darvesh N, Radhakrishnan A, Lachance CC, et al. 2020. [Exploring the prevalence of gaming disorder and Internet gaming disorder: a rapid scoping review](#). *Systematic Reviews*. 9(1);68.

Davies, M. (2002). Male sexual assault victims: A selective review of the literature and implications for support services. *Aggression and Violent Behavior*, 7, 203-214.

Davis K, Montag C. 2019. [Selected principles of Pankseppian affective neuroscience](#). *Front. Neurosci*. 12(1025);1-11.

Davis, V. 2012. [Interconnected but underprotected? Parents' methods and motivations for information seeking on digital safety issues](#). *Cyberpsychology, Behavior, and Social Networking*. 15(12);669-674.

De Berardis D, D'Albenzio A, Gambi F, et al. 2009 [Alexithymia and Its Relationships with Dissociative Experiences and Internet Addiction in a Nonclinical Sample](#). *CyberPsychology & Behavior*. 12(1);67-69.

De Iullis GN, Newey RJ, King BV, et al. 2009. [Mobile phone radiation induces reactive oxygen species production and DNA damage in human spermatozoa in vitro](#). *PLoS ONE*. 4(7);e6446.

De Iullis GN, Newey RJ, King BV, Aitken RJ. 2013. [Mobile Phone Radiation Induces Reactive Oxygen Species Production and DNA Damage in Human Spermatozoa In Vitro](#). *PLOS ONE* 8(3): 10.

Demetrovics Z, Király O, Koronczai B, et al. 2016. [Psychometric properties of the problematic internet use questionnaire short-form \(PIUQ-SF-6\) in a nationally representative sample of adolescents](#). *PLoS One*. 11(8);e0159409.

Dieu-Osika S, Bossière M-C, Osika E. 2020. [Early media overexposure syndrome must be suspected in toddlers who display speech delay with autism-like symptoms](#). *Global Pediatric Health*. 7;1-4.

Diller LH. 2008. [Running on Ritalin: a physician reflects on children, society, and performance of a pill](#). *Bantam Books*.

D'Oliveira TC et. al. 2023. [Workplace isolation, loneliness and wellbeing at work: The mediating role of task interdependence and supportive behaviors](#). *Applied Ergonomics*. 106; 103894.

Dong G, Devito EE, Du X, et al. 2012. [Impaired inhibitory control in 'internet addiction disorder': a functional magnetic resonance imaging study](#). *Psychiatry Research*. 203(2–3);153–158.

Dong G, Hu Y, Lin X. 2013. [Reward/punishment sensitivities among internet addicts: Implications for their addictive behaviors](#). *Progress in Neuro-Psychopharmacology & Biological Psychiatry*. 46;139–145.

Dong G, Potenza M. 2015. [Behavioural and brain responses related to Internet search and memory](#). *European Journal of Neuroscience*. Vol 42, Issue 8, 2546-2554.

Dooley DG, Rhodes H, Bandy A. 2022. [Pandemic recovery for children—beyond reopening schools](#).

dosReis S, Zito JM, Safer DJ, et al. 2005. [Multiple psychotropic medication use for youths: a two-state comparison](#). *Journal of Child and Adolescent Psychopharmacology*. 15(1);68-77.

- Dresp-Langley B. 2020. [Children's health in the digital age](#). *International Journal of Environmental Research and Public Health*. 17(9);3240.
- Dullur P, Hay P. 2017. [Problem internet use and internet gaming disorder: a survey of health literacy among psychiatrists from Australia and New Zealand](#). *Australasian Psychiatry*. 25(2);140-145.
- Dunckley, V. 2015. [Reset your child's brain – a four-week plan to end meltdowns, raise grades, and boost social skills by reversing the effects of electronic screen time](#). *New World Library, Novato*.
- Dunckley, V. Feb. 27, 2014. [Grey Matters: Too Much Screen Time Damages the Brain](#). Psychology Today. Retrieved from www.psychologytoday.com on May 31, 2023.
- Eastgate J. 2018. [Psychiatric drugs: create violence & suicide](#). A public interest report. *Citizens Commission on Human Rights International*. A Mental Health Industry Watchdog. 1-63.
- Egliston B. 2022. [The interface of the future': Mixed reality, intimate data and imagined temporalities](#). *Big Data and Society*. Feb. 24, 2022.
- Ehlman DC et.al. 2022. [Changes in Suicide Rates — United States, 2019 and 2020](#). *Centre for Disease Control – Morbidity and Mortality Weekly Report*. 71(8);306–312.
- Elgar FJ, Napoletano A, Saul G, et al. 2014. [Cyberbullying victimization and mental health in adolescents and the moderating role of family dinners](#). *JAMA Pediatr*. 168(11);1015-1022.
- Eliel LP, Palmieri GMA, Thomson JS, et al. 1971. [The relationships between adrenal cortical steroids, parathyroid extract, and calcitonin](#). *Pediatrics*. 47(1);229-238.
- Emre M, Cetiner S, Zencir S, et al. 2011. [Oxidative stress and apoptosis in relation to exposure to magnetic field](#). *Cell Biochemistry and Biophysics*. 59(2);71-77.
- Engelen L, Bundy AC, Bauman A, et al. 2014. [Young children's after-school activities - there's more to it than screen time: a cross-sectional study of young primary school children](#). *Center on Media and Child Health*.
- Englander EK. 2012. [Low risk associated with most teenage sexting: a study of 617 18-year-olds](#). *Massachusetts Aggression Reduction Centre*. In MARC Research Reports. Paper 6.
- Eşmekaya MA, Seyhan N, Ömeroğlu S. 2010. [Pulse modulated 900 MHz radiation induces hypothyroidism and apoptosis in thyroid cells: a light, electron microscopy and immunohistochemical study](#). *Int J Radiat Biol*. 86(12);1106-1116.
- Feldman R, Eidelman AI, Sirota L. 2002. [Comparison of skin-to-skin \(Kangaroo\) and traditional care: parenting outcomes and preterm infant development](#). *Pediatrics*. 110(1);16-26.
- Feng D, Reed DB, Esperat MC. 2011. [Effects of TV in the bedroom on young Hispanic children](#). *Am J Health Promot*. 25(5);310-318.
- Ferber SG, Feldman R, Makhoul IR. 2008. [The development of maternal touch across the first year of life](#). *Early Human Development*. 84(6);363-370.
- Fernández C, de Salles AA, Sears M.E, et al. 2018. [Absorption of wireless radiation in the child versus adult brain and](#)

[eye from cell phone conversation or virtual reality.](#) *Environ Res.* 167;694-699.

Feroe AG, Uppal N, Gutiérrez-Sacristán A, et al. 2021. [Medication use in the management of comorbidities among individuals with autism spectrum disorder from a large nationwide insurance database.](#) *JAMA Pediatr.*175(9);957-965.

Field T, Lasko D, Mundy. 1997. [Brief report: autistic children's attentiveness and responsivity improve after touch therapy.](#) *Journal of Autism and Developmental Disorders.* 27(3);333-338.

Field, T. 2010. [Touch for socioemotional and physical well-being: A review.](#) *Developmental Review.* 30(4);367-383.

Fioravanti G, Dèttore D, Casale S. 2012. [Adolescent internet addiction: testing the association between self-esteem, the perception of internet attributes, and preference for online social interactions.](#) *Cyberpsychology, Behavior, and Social Networking.* 15(6);318-323.

Firstenberg A. 2022. [International appeal to stop 5G on earth and in space.](#) *TRANSCEND Media Service.* 10 Jan 2022. Cell Phone Task Force.

Fleschler Peskin M, Markham CM, Addy RC, et al. 2013. [Prevalence and patterns of sexting among ethnic minority urban high school students.](#) *Cyberpsychology, Behavior, and Social Networking.* 16(6);454-459.

Flores PJ. 2004. [Addiction as an attachment disorder.](#) *Jason Aronson, Inc.*

Foss-Feig JH, Heacock JL, Cascio CJ. 2012. [Tactile responsiveness patterns and their association with core features in autism spectrum disorders.](#) *Res Autism Spectr Disord.* 6(1);337-344.

Foster HME, Ho FK, Sattar N, et al. 2020. [Understanding how much TV is too much: a non-linear analysis of the association between television viewing time and adverse health outcomes.](#) *Mayo Clinic Proceedings.* 95(11);2429-2441.

Frank JW. 2021. [Electromagnetic fields, 5G and health: what about the precautionary principle?](#) *J Epidemiol Community Health.* 75;562-566.

Frankel Heffler K, Oestreicher LM. 2015. [Causation model of autism: Audiovisual brain specialization in infancy competes with social brain networks.](#) *Medical Hypotheses.* 91;114-122.

Franki R. 2020. [U.S. fertility rates fall to record lows.](#) *MDedge.* Ob Gyn News.

Fraser AM, Padilla-Walker AM, Coyne SM, et al. 2012. [Associations between violent video gaming, empathic concern, and prosocial behavior toward strangers, friends, and family members.](#) *Journal of Youth and Adolescence.* 41(2012);636-649.

Frost MC, Kuo ES et. al. 2018. [Increase in Physical Activity Sustained 1 Year After Playground Intervention.](#) *American Journal of Preventative Medicine.* Vol. 54, Issue 5, Supplement 2, 124-129.

Fu, K., Ho, F. K. W., Rao, N., Jiang, F., Li, S. L., Lee, T. M., Chan, S. H., Yung, A. W., & Young, M. E. (2017). [Parental restriction reduces the harmful effects of in-bedroom electronic devices.](#) *Archives of Disease in Childhood,* 102(12), 1125–1131.

Fyfe-Johnson AL, Hazlehurst MF et. al. 2021. [Nature and children's health: A systematic review.](#) *Pediatrics.* 148(4).

Gandhi OP, Morgan LL, de Salles AA, et al. 2012. [Exposure limits: the underestimation of absorbed cell phone radiation, especially in children.](#) *Electromagn Biol Med.* 31(1);34-51.

- Gangwisch JE, Babiss LA, Malaspina D, et al. 2010. [Earlier parental set bedtimes as a protective factor against depression and suicidal ideation.](#) *Sleep.* 33(1);97-106.
- Gaskin CJ, Elsom SJ, Happell B. 2007. [Interventions for reducing the use of seclusion in psychiatric facilities: review of the literature.](#) *British Journal of Psychiatry.* 191;298-303.
- Gassó, A. M., Klettke, B., Agustina, J. R., & Montiel, I. (2019). [Sexting, Mental Health, and Victimization Among Adolescents: A Literature Review.](#) *International Journal of Environmental Research and Public Health,* 16(13), 2364.
- Gentile D, Reimer RA, Nathanson A, et al. 2014. [Protective effects of parental monitoring of children's media use.](#) *JAMA Pediatr.* 168(5);479-84.
- Gentile DA, Choo H, Liau A, Sim BWT, Li D, Fung D, Khoo A. 2011. [Pathological video game use among youths: A two-year longitudinal study.](#) *Pediatrics,* 127(2). <https://doi.org/10.1542/peds.2010-1353>.
- Gentile D. 2009. [Pathological video-game use among youth ages 8 to 18: a national study.](#) *Psychological Science.* 20(5);594-602.
- Gentile DA, Lynch PJ, Linder JR, et al. 2004. [The effects of violent video game habits on adolescent hostility, aggressive behaviors, and school performance.](#) *Journal of Adolescence* 27(1);5-22.
- Gentzler AL, Oberhauser AM, Westerman D, et al. 2011. [College students' use of electronic communication with parents: links to loneliness, attachment, and relationship quality.](#) *Cyberpsychology, Behavior, and Social Networking.* 14(1-2);71-74.
- Ghassemzadeh L, Shahraray M, Moradi A. 2008. [Prevalence of internet addiction and comparison of internet addicts and non-addicts in Iranian high schools.](#) *Cyberpsychol Behav.* 11(6);731-733.
- Gilbert, A. S., Schmidt, L., Beck, A., Kepper, M. M., Mazzucca, S., & Eyler, A. (2021). [Associations of physical activity and sedentary behaviors with child mental well-being during the COVID-19 pandemic.](#) *BMC Public Health,* 21(1), 1770-1770.
- Gilbert RL, Murphy NA, Ávalos M.C. et al. 2011. [Communication patterns and satisfaction levels in three-dimensional versus real-life intimate relationships.](#) *Cyberpsychol Behav Soc Netw.* 14(10);585-589.
- Giusti L, Mammarella S, Salza A, et al. 2021. [Predictors of academic performance during the covid-19 outbreak: impact of distance education on mental health, social cognition and memory abilities in an Italian university student sample.](#) *BMC Psychology.* 15(9);142.
- Glaser ZR. 1971. [Bibliography of reported biological phenomena \("effects"\) and clinical manifestations attributed to microwave and radio-frequency radiation.](#) *Naval Medical Research Institute Research Report.* Report No. 2 Revised;1-103.
- Golberstein E, Wen H, Miller BF. 2020. [Coronavirus disease 2019 \(COVID-19\) and mental health for children and adolescents.](#) *JAMA Pediatrics.* 174(9);819–820.
- Goldberg ER, Simner ML. 1999. [A comparison of children's handwriting under traditional vs. whole language instruction.](#) *Canadian Journal of School Psychology.* 14(2);11-30.
- Goodwin R, Gould MS, Blanco C, et al. 2001. [Prescription of psychotropic medications to youth in office-based](#)

[practices](#). *Psychiatr Serv.* 52(8);1081-1087.

Gordon JB. 2020. [Child abuse and neglect contributing to youth suicide](#). *JAMA Pediatrics.* 174(12);1214.

Goswami V, Singh DR, et al. 2022. [To study the extent of video game addiction and effect of intervention among adolescents](#). *International Journal of Home Science.* 8(1);166-168.

Government of Western Australia – Department of Health. 7 February, 2010. [Raine ADHD Study: Long-term outcomes associated with stimulant medication in the treatment of ADHD in children](#).

Graham S, Harris K and Fink B. (2000). [Is handwriting causally related to learning to write? Treatment of handwriting problems in beginning writers](#). *Journal of Educational Psychology.* 92(4);620-633.

Graham S, Harris KR, Mason L, et al. 2008. [How do primary grade teachers teach handwriting? A national survey](#). *Reading and Writing: An Interdisciplinary Journal.* 21(1-2);49-69.

Graham S, MacArthur CA, Hebert MA. 2007. [Best practices in writing instruction](#). (3rd ed.). *The Guilford Press*.

Graham S, Harris KR et. Al. 2008. [How do primary grade teachers teach handwriting? A National Survey](#). *Journal of Reading and Writing.* 21, 49-69.

Graham S, Weintraub N. 1996. [A review of handwriting research: progress and prospects from 1980 to 1994](#). *Educational Psychology Review.* 8(1);7-87.

Gray, P. September 22, 2015. [Declining student resilience: A Serious Problem for Colleges](#). *Psychology Today*. Green Schoolyards America. [Covid-19 outdoor learning](#).

Grietemeyer, T. 2022. [The dark and bright side of video game consumption: Effects of violent and prosocial video games](#). *Current Opinion in Psychology.* Vol. 46, 101326.

Grummitt LR, Kreski NT, Kim SG, et al. 2021. [Association of childhood adversity with morbidity and mortality in us adults: A systematic review](#). *JAMA Pediatr.* 175(12);1269–1278.

Gupta SK, Patel SK, Tomar MS. 2019. [Long-term exposure of 2450 MHz electromagnetic radiation induces stress and anxiety like behavior in rats](#). *Neurochemistry International.* 128(2019);1-13.

Gustafsson, E., Johnson, P. W., & Hagberg, M. (2010). Thumb postures and physical loads during mobile phone use - a comparison of young adults with and without musculoskeletal symptoms. *Journal of electromyography and kinesiology: official journal of the International Society of Electrophysiological Kinesiology*, 20(1), 127–135.

Hackl-Wimmer S, Waltraud Eglmaier, MT. 2021. [Effects of Touchscreen Media Use on Toddlers' Sleep: Insights from Longtime ECG Monitoring](#). *Sensors.* Nov. 12;21(22):7515.

Hale L, Guan S. 2015. [Screen time and sleep among school-aged children and adolescents: a systematic literature review](#). *Sleep Med Rev.* 21;50-8.

Hale L, Kirschen GW, LeBourgeois MK, et al. 2018. [Youth screen media habits and sleep: sleep-friendly screen behavior recommendations for clinicians, educators and parents](#). *Child and Adolescent Psychiatric Clinics of North America.* 27;229-245.

Hamilton S. 2006. [Screening for developmental delay: reliable, easy-to-use tools](#). *Journal of Family Practice.* 55(5);415-422.

- Han DH, Bolo N, Daniels MA, et al. 2011. [Brain activity and desire for internet video game play](#). *Comprehensive Psychiatry*. 52(1);88–95.
- Hancox RJ, Milne BJ, Poulton R. 2005. [Association of television during childhood with poor educational achievement](#). *Archives of Pediatric and Adolescent Medicine*. 159(7);614-618.
- Hanno EC, Fritz LS, Jones SM, et al. 2022. [School learning format and children’s behavioral health during the COVID-19 pandemic](#). *JAMA Pediatr*. 2022 Jan 10;e215698.
- Hansraj KK. 2014. [Assessment of stresses in the cervical spine caused by posture and position of the head](#). *Surgical Technology International*. 25;277-279.
- Hardell L, Carlberg M, Soderqvist F, et al. 2013. [Pooled analysis of case-control studies on acoustic neuroma diagnosed 1997-2003 and 2007-2009 and use of mobile and cordless phones](#). *International Journal of Oncology*. 43(4);1036-1044.
- Hardell L. 2017. [World Health Organization, radiofrequency radiation and health - a hard nut to crack \(Review\)](#). *International Journal of Oncology*. 51(2017);405-413.
- Harlé B. 2019. [Intensive early screen exposure as a causal factor for symptoms of autistic spectrum disorder: The case for Virtual Autism](#). *Trends in Neuroscience and Education*. 17;100119.
- Harlow HF, Dodsworth RO, Harlow MK. 1965. [Total social isolation in monkeys](#). *Proceedings of the National Academy of Sciences of the United States of America*. 54(1);90–97.
- Harness J et. al. 2022. [Youth Insight About Social Media Effects on Well/Ill-Being and Self-Modulating Efforts](#). *Adolescent Health*. 2022 Sep;71(3):324-333.
- Harrison K, Vallina L, Couture A, et al. 2019. [Sensory curation: Theorizing media use for sensory regulation and implications for family media conflict](#). *Media Psychology*. 22(4);653–688.
- Harvey-Berino J, Rourke J. 2003. [Obesity prevention in preschool native-American children: a pilot study using home visiting](#). *Obesity Research*. 11(5);606-611.
- Hasan I, Jahan MR, Islam MN, et al. 2021. [Effect of 2400 MHz mobile phone radiation exposure on the behavior and hippocampus morphology in Swiss mouse model](#). *Saudi Journal of Biological Sciences*. Sept. '21.
- Hatano A, Ogulmus C, Shigemasu H, Murayama K. 2022. [Thinking about thinking: People underestimate how enjoyable and engaging just waiting is](#). *Journal of Experimental Psychology Gen*. Dec;151(12):3213-3229.
- He J, Liu Ch, Guo Y, et al. 2011. [Deficits in early-stage face perception in excessive internet users](#). *Cyberpsychology, Behavior, and Social Networking*. 14(5);303-308.
- Heerwagen JH. 2006. [Investing in people: the social benefits of sustainable design](#). *Semantic Scholar*. Corpus ID 14889194.
- Heffler K, Frome L et. Al. 2022. [Screen time reduction and focus on social engagement in autism spectrum disorder: A pilot study](#). *Pediatrics International*. Jan;64(1):e15343.
- Heffler KF, Sienko DM, Subedi K, et al. 2020. [Association of early-life social and digital media experiences with development of autism spectrum disorder-like symptoms](#). *JAMA Pediatr*. 174(7);690-696.

- Heffler K, Oestreicher OM. 2015. [Causational model of autism: audiovisual brain specialization in infancy competes with social brain networks](#). *Medical Hypotheses*. 91(2016);1-124
- Hellfeldt K, Lopex-Romero L, Andershed H. 2020. [Cyberbullying and Psychological Well-being in Young Adolescence: The Potential Protective Mediation Effects of Social Support from Family, Friends, and Teachers](#). *International Journal of Environmental Research and Public Health*. 17(1);45.
- Henning, R. A., Jacques, P., Kissel, G. V., Sullivan, A. B., & Alteras-Webb, S. M. (1997). [Frequent short rest breaks from computer work: effects on productivity and well-being at two field sites](#). *Ergonomics*, 40(1), 78–91.
- Herbert MR, Sage C. 2013. [Autism and EMF? Plausibility of a pathophysiological link – part I](#). *Pathophysiology*. 20(3);191-209.
- Hillman E. Intel Security Digital Safety Program. 2014, November 13. [Teens and the screen study: exploring online privacy, social networking and cyber bullying in Singapore](#). *Discovery Education*.
- Hinduja S, Patchin JW. 2010. [Bullying, cyberbullying, and suicide](#). *Archives of Suicide Research*. 14(3);206-221.
- Hipp D, Olsen S, Gerhardstein P. 2020. [Mind-craft: exploring the effect of digital visual experience on changes to orientation sensitivity in visual contour perception](#). *Perception*. 49(10);1005-1025.
- Ho B, Andreasen NC, Ziebell S. 2011. [Long-term antipsychotic treatment and brain volumes a longitudinal study of first-episode schizophrenia](#). *Arch Gen Psychiatry*. 68(2);128-137.
- Hoge E, Bickham D, Cantor J. 2017. [Digital media, anxiety, and depression in children](#). *Pediatrics*. 140(supp 2);S76-S80.
- Hoge MA, Vanderploeg J, Paris M. et al. 2022. [Emergency department use by children and youth with mental health conditions: a health equity agenda](#). *Community Mental Health Journal*. 17;1–15.
- Holte AJ, Ferraro FR. 2020. [True colors: grayscale setting reduces screen time in college students](#). *The Social Science Journal*. 1-17.
- Hong SB, Kim JW, Choi EJ, et al. 2013. [Reduced orbitofrontal cortical thickness in male adolescents with internet addiction](#). *Behavioral and Brain Functions*. 9(11);1-5.
- Hong SB, Zalesky A, Cocchi L, et al. 2013. [Decreased functional brain connectivity in adolescents with internet addiction](#). *PLoS One*. 8(2);e57831.
- Horvath CW. 2004. [Measuring television addiction](#). *Journal of Broadcasting and Electronic Media*. 48(3);378-398.
- Hou H, Jia S, Hu S, et al. 2012. [Reduced striatal dopamine transporters in people with internet addiction disorder](#). *Journal of Biomedicine & Biotechnology*. 2012;854524.
- Houtrow AJ, Larson K, Olson LM, et al. 2014. [Changing trends of childhood disability](#). *Pediatrics*. 134(3);530–538.
- Howard AW, MacArthur C, Willan A, et al. 2005. [The effect of safer play equipment on playground injury rates among school children](#). *Canadian Medical Association Journal*. 172(11);1443-1446.
- Howard AW. 2010. [Keeping children safe: rethinking how we design our environments](#). *Canadian Medical Association Journal*. 182(6);573-577.

- Howell A. 2013. [Our national obsession with toddlers and tiaras](#). *Anthropology Now*. 5(1);85–92.
- Huesmann LR, Moise-Titus J et. Al. 2003. [Longitudinal relations between children’s exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977-1992](#). *Developmental Psychology*. Mar;39(2):201-21.
- Huesmann LR. 2007. [The impact of electronic media violence: scientific theory and research](#). *Journal of Adolescent Health*. 41(6 supp. 1);S6-S13.
- Hugh S, Taylor MD. 2016. [Fetal exposure to cell phones](#).
- Hull D, Williams GA, Griffiths MD. 2013. [Video game characteristics, happiness and flow as predictors of addiction among video game players: a pilot study](#). *Journal of Behavioral Addictions*. 2;145-152.
- Hundt A, Agnew W, Zeng V, Kacianka S, & Gombolay M. 2022. [Robots Enact Malignant Stereotypes](#). *FACCT '22: 2022 ACM Conference on Fairness, Accountability, and Transparency*, ACM Digital Library.
- Hutton JS, Dudley J, Horowitz-Kraus T, et al. 2020. [Associations between screen-based media use and brain white matter integrity in preschool-aged children](#). *JAMA Pediatr*. 174(1);e:193869.
- Hwang J, Lee IM, Fernandez AM, et al. 2019. [Exploring energy expenditure and body movement of exergaming in children of different weight status](#). *Pediatric exercise science*. 31(4);438–447.
- Insel TR, Young LJ. 2001. [The neurobiology of attachment](#). *Nature Reviews Neuroscience*. 2;129-136.
- International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF). 2022. [Scientific evidence invalidates health assumptions underlying the FCC and ICNIRP exposure limit determinations for radiofrequency radiation: implications for 5G](#). *Environmental Health*, 21(1), 1–92.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2020. [ICNIRP statement: principles for non-ionizing radiation protection](#). *Health Physics*. 118(5);477–482.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2020. [Guidelines for limiting exposure to electromagnetic fields \(100 kHz to 300 GHz\)](#). *Health Physics*. 118(5);483-524.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2020. [ICNIRP note: critical evaluation of two radiofrequency electromagnetic field animal carcinogenicity studies published in 2018](#). *Health Physics*. 118(5);525-532.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2020. [Gaps in knowledge relevant to the “Guidelines for limiting exposure to time-varying electric and magnetic fields \(1 Hz – 100 kHz\)”](#). *Health Physics*. 118(5);533-542.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2020. [Comments on the 2013 ICNIRP Laser Guidelines](#). *Health Physics*. 118(5);543-548.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2020. [Light-emitting diodes \(LEDs\): implications for safety](#). *Health Physics*. 118(5);549-561.
- International Commission on Non-Ionizing Radiation Protection (ICNIRP). 2020. [Intended human exposure to non-ionizing radiation for cosmetic purposes](#). *Health Physics*. 118(5);562-579.

International Commission on Non-Ionizing Radiation Protection. 2013. [ICNIRP guidelines on limits of exposure to laser radiation of wavelengths between 180 nm and 1,000 μm](#). *Health Physics*. 105(3);271-295.

International Institute for Trauma and Addiction Professionals. 2017. [SASH List of Research Resources](#).

Internet Safety Labs. 2021. [School Mobile Apps Student Data Sharing Behavior](#); Spotlight Report #1.

Internet Safety Labs. 2022. [K12 Edtech Safety Benchmark: National Findings – Part 1](#). Retrieved on May 11, '23.

Ioannidis K, Treder MS, Chamberlain SR, et al. 2018. [Problematic internet use as an age-related multifaceted problem: evidence from a two-site survey](#). *Addictive Behaviors*. 81;157-166.

James K, Miller LJ, Schaaf R, et al. 2011. [Phenotypes within sensory modulation dysfunction](#). *Comprehensive Psychiatry*. 52(6):715-724.

Jennings JT. 2005. [Conveying the message about optimal infant positions](#). *Physical and Occupational Therapy in Pediatrics*. 25(3);3-18.

Jensen PS, Cooper JR. 2002. [Attention deficit hyperactivity disorder: state of science – best practices](#). *Civic Research Institute*.

Jeong EJ, Kim DG. 2011. [Social activities, self-efficacy, game attitudes, and game addiction](#). *Cyberpsychology, Behavior, and Social Networking*. 14(4);213-221.

Johnson D, Policelli J, Li M, et al. 2021. [Associations of early-life threat and deprivation with executive functioning in childhood and adolescence: a systematic review and meta-analysis](#). *JAMA Pediatr*. 175(11);e212511.

Johnson JG, Cohen P, Kasen S, et al. 2007. [Extensive television viewing and the development of attention and learning difficulties during adolescence](#). *The Archives of Pediatrics & Adolescent Medicine*. 161(5);480-486.

Joiner R, Gavin J, Brosnan M, et al. 2012. [Gender, internet experience, internet identification, and internet anxiety: a ten-year followup](#). *Cyberpsychology, Behavior, and Social Networking*. 15(7);370-372.

Jung SI, Lee NK, Kang KW, et al. 2016. [The effect of smartphone usage time on posture and respiratory function](#). *Journal of Physical Therapy Science*. 28(1);186-189.

Kaiser Family Foundation Report. 2010. [Generation M2: media in the lives of 8- to 18-year-olds](#).

Kaplan S, Deniz OG, Önger ME, et al. 2016. [Electromagnetic field and brain development](#). *Journal of Chemical Neuroanatomy*. 75(pt.B);52-61.

Kaplan S. 1995. [The restorative benefits of nature: toward an integrative framework](#). *Journal of Environmental Psychology*. 15(3);169-182.

Kasteleijn-Nolst Trenité DG, Martins da Silva A, Ricci S, et al. 2002. [Video games are exciting: a European study of video game-induced seizures and epilepsy](#). *Epileptic Disorders*. 4(2);121-128.

Kessler RC, Adler L, Barkley R, et al. 2006. [The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication](#). *American Journal of Psychiatry*. 163(4);716-723.

Khan, M. W., Juutilainen, J., Naarala, J., & Roivainen, P. (2022). [Residential extremely low frequency magnetic fields and skin cancer](#). *Occupational and environmental medicine*, 79(1), 49–54.

- Khan A, Lee EY, Rosenbaum S, et al. 2021. [Dose-dependent and joint associations between screen time, physical activity, and mental wellbeing in adolescents: an international observational study](#). *The Lancet Child & Adolescent Health*. 5(10);729-738.
- Khurana VG, Teo C, Kundi M, et al. 2009. [Cell phones and brain tumors: a review including long-term epidemiologic data](#). *Surgical Neurology*. 72(3);205-214.
- Kim HH, Ahn SJ. 2016. [How does neighborhood quality moderate the association between online video game play and depression? A population-level analysis of Korean students](#). *Cyberpsychology, Behavior, and Social Networking*. 19(10);628-634.
- Kim KJ, Sundar SS. 2013. [Can interface features affect aggression resulting from violent video game play? An examination of realistic controller and large screen size](#). *Cyberpsychology, Behavior, and Social Networking*. 16(5);329-334.
- Kim SH, Baik SH, Park CS, et al. 2011. [Reduced striatal dopamine D2 receptors in people with internet addiction](#). *Neuroreport*. 22(8);407-411.
- Kirkorian H, Pempek T, Choi K. 2017. [The role of online processing in young children's learning from interactive and noninteractive digital media](#). *Media exposure during infancy and early childhood*. The effects of content and context on learning and development (pp.65-89). Springer International Publishing AG.
- Kittinger R, Correia CJ, Irons JG. 2012. [Relationship between Facebook use and problematic internet use among college students](#). *Cyberpsychology, Behavior, and Social Networking*. 15(6);324-327.
- Kleiber CE. 2017. [Radiation from wireless technology elevates blood glucose and body temperature in 40-year-old type 1 diabetic male](#). *Electromagnetic Biology and Medicine*. 36(3);259-264.
- Klein C, Kennedy MA, Gorzalka BB. 2009. [Rape myth acceptance in men who completed the prostitution offender program of British Columbia](#). *International Journal of Offender Therapy and Comparative Criminology*. 53(3):305-315.
- Klintwall L, Holm A, Eriksson M, et al. 2011. [Sensory abnormalities in autism. A brief report](#). *Research in Developmental Disabilities*. 32(2);795-800.
- Ko CH, Liu GC, Hsiao S, et al. 2009. [Brain activities associated with gaming urge of online gaming addiction](#). *Journal of Psychiatric Research*. 43(7);739-747.
- Kobayashi H, Song C, Ikei H, et al. 2015. [Analysis of individual variations in autonomic responses to urban and forest environments](#). *Evidence-based Complementary and Alternative Medicine*. 2015(1);671094.
- Kobilke, L., & Markiewitz, A. (2021). The Momo Challenge: measuring the extent to which YouTube portrays harmful and helpful depictions of a suicide game. *SN Social Sciences*, 1(4).
- Kolhar M et. Al. 2021. [Effect of social media use on learning, social interactions, and sleep duration among university students](#). *Saudi Journal of Biological Sciences*. Vol 28, Issue 4.
- Koo C, Wati Y, Lee CC, et al. 2011. [Internet-addicted kids and South Korean government efforts: boot-camp case](#). *Cyberpsychol Behav Soc Netw*. 14(6);391-394.
- Korkman M. 2001. [Introduction to the special issue on normal neuropsychological development in the school-age years](#). *Developmental Neuropsychology*. 20(1);325-330.

- Kowalski RM, Limber SP. 2007. [Electronic bullying among middle school students](#). *Journal of Adolescent Health*. 41(6 supp. 1);S22-30.
- Kroshus E, Christakis D. 2021. [Family media use planning with teens—is it time for shared decision-making?](#) *JAMA Pediatrics*. 175(4);349–350.
- Kuehn BM. 2021. [Increase in myopia reported among children during COVID-19 lockdown](#). *JAMA*. 326(11);999.
- Kuhn S. 2019. [Effects of computer gaming on cognition, brain structure and function: a critical reflection on existing literature](#). *Dialogues on Clinical Neuroscience*. Sep;21(3):319-330.
- Kühn S, Gallinat J. 2016. [Chapter three - neurobiological basis of hypersexuality](#). *International Review of Neurobiology*. 129(2016);67-83.
- Kuhn S, Gallinat J. 2014. [Brain Structure and Functional Connectivity Associated With Pornography Consumption - The Brain on Porn](#). *JAMA Psychiatry*. 2014;71(7):827-834.
- Kühn S, Romanowski A, Schilling C, et al. 2011. [The neural basis of video gaming](#). *Translational Psychiatry*. 1(11);e53.
- Kuo FE, Taylor AF. 2004. [A potential natural treatment for attention-deficit/hyperactivity disorder: evidence from a national study](#). *American Journal of Public Health*. 94(9);1580-1586.
- Kuo M, Barnes M, Jordan C. 2019. [Do experiences with nature promote learning? Converging evidence of a cause-and-effect relationship](#). *Frontiers in Psychology*. 10(2019);305.
- Kushima M, Kojima R. 2022. [Association Between Screen Time Exposure in Children at 1 Year of Age and Autism Spectrum Disorder at 3 Years of Age: The Japan Environment and Children’s Study](#). *JAMA Pediatrics*, 176(4):384-391.
- Kushlev K, Dunn EW. 2018. [Smartphones distract parents from cultivating feelings of connection when spending time with their children](#). *Journal of Social and Personal Relationships*. 36(6);1619-1639.
- Kusisto L, Sun M. October 5, 2021. [The Facebook Whistleblower, Frances Haugen: Does the Law Protect Her?](#) *The Wall Street Journal*.
- Kuss DJ, Griffiths MD, Binder JF. 2013. [Internet addiction in students: Prevalence and risk factors](#). *Computers in Human Behaviour*. 29(3);959-966.
- Lam LT, Cheng Z, Liu X. 2013. [Violent online games exposure and cyberbullying/victimization among adolescents](#). *Cyberpsychology, Behavior, and Social Networking*. 16(3);159-165.
- Lane SJ, Reynolds S, Thacker L. 2010. [Sensory over-responsivity and ADHD: differentiating using electrodermal responses, cortisol, and anxiety](#). *Frontiers in Integrative Neuroscience*. 4(8);1-11.
- Lang R, Kern Koegel L, Ashbaugh K, et al. 2010. [Physical exercise and individuals with autism spectrum disorders: a systematic review](#). *Research in Autism Spectrum Disorders*. 4(4);565-576.
- Lee HW, Choi JS, Shin YC, et al. 2012. [Impulsivity in internet addiction: a comparison with pathological gambling](#). *Cyberpsychology, Behavior, and Social Networking*. 15(7);373-377.
- Lee SJ, Chae YG. 2012. [Balancing participation and risks in children’s internet use: the role of internet literacy and parental mediation](#). *Cyberpsychology, Behavior, and Social Networking* 15(5);257-262.

- Leggett S. February, 2020. [Mobile phone ownership and usage is up among kids – but it can be tough parenting this more private and personal technology](#). *Childwise Monitor*. UK survey.
- Lenhart A, Ling R, Campbell S, et al. 2010. [Teens and mobile phones](#). *Pew Internet & American Life Project*. An initiative of the Pew Research Center;1-114.
- Lenzer J. 2004. [FDA hearings confirm risks of antidepressants](#). *The BMJ (Clinical research ed.)*. 329(7467);641.
- Lerner C, Barr R. 2014. [Screen sense: setting the record straight. research-based guidelines for screen use for children under 3 years old](#). *Zero To Three*. 1-10.
- Li D, Chen H, Chen H, et al. 2011. [Maternal exposure to magnetic fields during pregnancy in relation to the risk of asthma in offspring](#). *Arch Pediatr Adolesc Med*. 165(10);945–950.
- Liberatore KA, Rosario K, Colón-De Martí LN, et al. 2011. [Prevalence of internet addiction in Latino adolescents with psychiatric diagnosis](#). *Cyberpsychology, Behavior, and Social Networking*. 14(6);399-402.
- Lin F, Zhou Y, Du Y, et al. 2012. [Abnormal white matter integrity in adolescents with internet addiction disorder: a tract-based spatial statistics study](#). *PLoS ONE*. 7(1);e30253.
- Lindgren L, Jacobsson M, Lämås K. 2014. [Touch Massage, a Rewarding Experience](#). *Journal of Holistic Nursing*. 32(4);261-268.
- Lipnowski S. 2012. [Healthy active living: Physical activity guidelines for children and adolescents](#). *Canadian Paediatric Society, Abridged version: Paediatric Child Health*. 17(4);209-210.
- Lissak G. 2018. [Adverse physiological and psychological effects of screen time on children and adolescents: Literature review and case study](#). *Environmental Research*. 164:149-157.
- Liu M, Wu L, Yao S. 2016. [Dose-response association of screen time-based sedentary behaviour in children and adolescents and depression: a meta-analysis of observational studies](#). *British Journal of Sports Medicine*. Oct;50(20):1252-1258.
- Lo CB, Bridge JA, Shi J, et al. 2021. [Children’s mental health emergency department visits: 2007–2016](#). *Pediatrics*. 145(6);e20191536.
- Lorah ER, Parnell A, Schaefer Whitby P, et al. 2015. [A systematic review of tablet computers and portable media players as speech generating devices for individuals with autism spectrum disorders](#). *Journal of Autism Developmental Disorders*. 45;3792–3804.
- Lorenz T, January 8. 2019. [Teens are spamming Instagram to fight an apparent network of child porn](#). *The Atlantic*.
- Lorenz T. 2018. [Teens are being bullied ‘constantly’ on Instagram](#). *The Atlantic*.
- Louv R. 2010. [Last child in the woods: saving our children from Nature-Deficit Disorder](#). *Atlantic Books*.
- Luo T, Wei D, Guo J, Hu M, Chao X, Sun Y, Xiao S, Liao Y. 2022. [Diagnostic Contribution of the DSM-5 Criteria for Internet Gaming Disorder](#). *Frontiers in Psychiatry*. Jan. 5, '22.
- Lu DW, Wang JW, Huang AChW, 2010. [Differentiation of internet addiction risk level based on autonomic nervous responses: the internet-addiction hypothesis of autonomic activity](#). *Cyberpsychology, Behaviour, and Social*

Networking. 13(4);371-378.

Lyubykh, Z., Gulseren, D., Premji, Z., Wingate, T. G., Deng, C., Bélanger, L. J., & Turner, N. (2022). [Role of work breaks in well-being and performance: A systematic review and future research agenda](#). *Journal of Occupational Health Psychology*, 27(5), 470–487.

Macarthur C, Hu X, Wesson DE, et al. 2000. [Risk factors for severe injuries associated with falls from playground equipment](#). *Accident Analysis and Prevention*. 32(3);377-382.

MacArthur CA, Graham S, Fitzgerald. 2016. [Handbook of writing research](#). (2nd ed.). *The Guilford Press*.

MacMullin JA, Lunsky Y, Weiss JA. 2013. [Plugged in: electronics use in youth and young adults with autism spectrum disorder](#). *Autism*. 20(1);45-54.

Macnow T, Curran T, Tolliday C, et al. 2021. [Effect of screen time on recovery from concussion - a randomized clinical trial](#). *JAMA Pediatrics*. 175(11);1124-1131.

Madigan S, Browne D, Racine N Mori C, Tough S. 2019. [Association between screen time and children’s performance on a developmental screening test](#). *JAMA Pediatr*. 173(3);244-250.

Madigan S, McArthur BA, Anhorn C, et al. 2020. [Associations between screen use and child language skills: a systematic review and meta-analysis](#). *JAMA Pediatr*. 174(7);665-675.

Mandell DS, Morales KH, Marcus SC, et al. 2008. [Psychotropic medication use among Medicaid-enrolled children with autism spectrum disorders](#). *Pediatrics*. 121(3);e441-448.

Mangen A. 2008. [Hypertext fiction reading: haptics and immersion](#). *Journal of Research*. 31(4);404-419.

Mangen A, Walgermo B et. Al. 2013. [Reading Linear Texts on Paper Versus Computer Screen: Effects of Reading Comprehension](#). *International Journal of Educational Research*. 658, 61-68.

Marchica LA, Richard J, Nower L, Ivoska W, Derevensky JL. 2022. [Problem video gaming in adolescents: An examination of the Pathways Model](#). *International Gambling Studies*. Vol. 22, issue 2, 282-299.

Marino AA, Kim PY, Clifton Frilot II. 2017. [Trigeminal neurons detect cellphone radiation: thermal or nonthermal is not the question](#). *Electromagnetic Biology and Medicine*. 36(2);123-131.

Markho F, Tuleasca I. 2016. [Major influences in households and business spaces — Wi-Fi, telecommunication masts outputs and electrical pollution](#). *International Conference and Exposition on Electrical and Power Engineering*. 815-822.

Martin RC, Coyier KR, VanSistine LM, et al. 2013. [Anger on the internet: the perceived value of rant-sites](#). *Cyberpsychology, Behavior, and Social Networking*. 16(2);119-122.

Mascheroni G, Vincent J, Jimenez E. 2015. [“Girls are addicted to likes so they post semi-naked selfies”: Peer mediation, normativity and the construction of identity online](#). *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*. 9(1);1-5.

Matar Boumosleh J, Jaalouk D. 2017. [Depression, anxiety, and smartphone addiction in university students- a cross sectional study](#). *Plos One*. 12(8);e0182239.

Mate G. 2000. [Scattered Minds: The origins and healing of attention deficit disorder](#). Vintage Books Canada. Mawji A, Vollman AR, Hatfield J, et al. 2013. [The incidence of positional plagiocephaly: a cohort study](#). *Pediatrics* 132(2);298-

- May-Benson TA, Cermak SA. 2007. [Development of an assessment for ideational praxis](#). *American Journal of Occupational Therapy*. 61(2);148–153.
- Mazurek MO, Engelhardt CR. 2013. [Video game use and problem behaviors in boys with autism spectrum disorders](#). *Research in Autism Spectrum Disorders*. 7(2);316-324.
- Mazurek MO, Engelhardt CR. 2013. [Video game use in boys with autism spectrum disorder, ADHD or typical development](#). *Pediatrics*. 132(2);260-266.
- Mazurek MO, Shattuck PT, Wagner M, Cooper BP. 2012. [Prevalence and correlates of screen-based media use among youths with autism spectrum disorders](#). *Journal of Autism and Developmental Disorders*. 42;1757-1767.
- McCrorie P, Mitchell R, Macdonald L. et al. 2020. [The relationship between living in urban and rural areas of Scotland and children’s physical activity and sedentary levels: a country-wide cross-sectional analysis](#). *BMC Public Health*. 20(304);1-11.
- McEwan K, Waddell C, Barker J. 2007. [Bringing children's mental health “out of the shadows”](#). *Canadian Medical Association Journal*. 176(4);471-472.
- Meier EP, Gray J. 2014. [Facebook photo activity associated with body image disturbance in adolescent girls](#). *Cyberpsychology, Behavior, and Social Networking*. 17(4);199-206.
- Mentzoni RA, Brunborg GS, Molde H, et al. 2011. [Problematic video game use: estimated prevalence and associations with mental and physical health](#). *Cyberpsychology, Behavior, and Social Networking*. 14(10);591-596.
- Merrow J. 2010. [Below C Level: How American education encourages mediocrity and what we can do about it](#). *CreateSpace Independent Publishing Platform*.
- Mestre-Bach G, Blycker GR, Potenza MN. 2020. [Pornography use in the setting of the COVID-19 pandemic](#). *Journal of Behavioral Addictions*. 9(2);181-183.
- Mihara S, Higuchi S. 2017. [Cross-sectional and longitudinal epidemiological studies of Internet Gaming Disorder: a systematic review of the literature](#). *Psychiatry and Clinical Neurosciences*. 71;425-444.
- Miller LJ, Nielsen DM, Schoen SA. 2012. [Attention deficit hyperactivity disorder and sensory modulation disorder: a comparison of behavior and physiology](#). *Research in Developmental Disabilities*. 33(3);804-818.
- Mitra M, Rath P. 2017. [Effect of internet on the psychosomatic health of adolescent school children in Rourkela - a cross-sectional study](#). *Indian Journal of Child Health*. 4(3);289-293.
- Moncrieff, J., Cooper, R.E., Stockmann, T. et al. The serotonin theory of depression: a systematic umbrella review of the evidence. *Mol Psychiatry* (2022).
- Monostra M. June 26, 2021. [New-onset pediatric type 2 diabetes cases increase 182% during first year of COVID-19](#). *Endocrine Today*.
- Montag C, Elhai JD. 2020. [Discussing digital technology overuse in children and adolescents during the COVID-19 pandemic and beyond: On the importance of considering Affective Neuroscience Theory](#). *Addictive Behaviors Reports*. 12(2020);100313.

- Montagu A. 1986. [Touching: The human significance of the skin](#) (3rd ed.). *William Morrow Paperbacks*. Moon JW.
2020. [Health effects of electromagnetic fields on children](#). *CEP*. 63(11);422–428.
- Moreau G. 2021. [Police-reported hate crime in Canada, 2019](#). Catalogue no. 85-002-X ISSN 1209-6393. Retrieved from the [Statistics Canada website](#).
- Moreno MA, Binger KS, Zhao Q, et al. 2021. [Effect of a family media use plan on media rule engagement among adolescents: a randomized clinical trial](#). *JAMA Pediatr*. 175(4);351-358.
- Morgan LL, Miller AB, Sasco A, et al. 2015. [Mobile phone radiation causes brain tumors and should be classified as a probable human carcinogen \(2A\) \(review\)](#). *International Journal of Oncology*. 46(5);1865-1871.
- Mössle T, Kleimann M, Rehbein F, et al. 2010. [Media use and school achievement--boys at risk?](#) *Br J Dev Psychol*. 28(3);699-725.
- Mueller PA, Oppenheimer DM. 2014. [The pen is mightier than the keyboard: advantages of longhand over laptop note taking](#). *Psychological Science*. 25(6);1159-1168.
- Mukaddes NM, Bilge S, Alyanak B, et al. 2000. [Clinical characteristics and treatment responses in cases diagnosed as Reactive Attachment Disorder](#). *Child Psychiatry and Human Development*. 30(4);273-287.
- Muñoz RF, Cooper LA. 2022. [The COVID-19 pandemic and mental health—implementing evidence-based interventions to advance equity and reverse a worsening crisis](#). *JAMA Health Forum*. 3(4);e221282.
- Muralidharan S, Fenton M. 2006. [Containment strategies for people with serious mental illness \(Review\)](#). *Cochrane Database Syst Rev*. 3(3);CD002084.
- Murray R, Ramsletter C et. al. 2013. [The Crucial Rôle of Recess in School](#). American Academy of Pediatrics Council on School Health. *Pediatrics* (2013) 131 (1): 183–188.
- Murray JP, Liotti M, Ingmundson P, et al. 2006. [Children’s brain activations while viewing televised violence revealed by fMRI](#). *Media Psychology*. 8(1);25-37.
- Nagata JM, Cortex CA, Cattle CJ, et al. 2022. [Screen time use among us adolescents during the Covid-19 pandemic - findings from the Adolescent Brain Cognitive Development \(ABCD\) Study](#). *JAMA Pediatr*. 176(1);94-96.
- National Assessment of Educational Progress. 2022. [NAEP 4th and 8th Grade Math Performance, More Students Fail to Meet Basic Achievement](#). Retrieved Mar. '23.
- National Sleep Foundation. 2020. Retrieved from www.thensf.org.
- Nelson CA, Fox NA, Zeanah CH. 2014. [Romania’s abandoned children: deprivation, brain development and the struggle for recovery](#). Harvard University Press.
- Nelson MC, Neumark-Stzainer D, Hannan PJ, et al. 2006. [Longitudinal and secular trends in physical activity and sedentary behavior during adolescence](#). *Pediatrics*. 118(6);1627-1634.
- Nichols D. 2022. [The context of background TV exposure and children's executive functioning](#). *Pediatric Research*. 1-7.
- Nicole Thompson for CBC News on Feb. 15, '21. [Reports of domestic, intimate partner violence continue to rise during](#)

[pandemic](#). *The Canadian Press*. Toronto.

Niederkrötenhaller T, Voracek M, Herberth A, Till B, Strauss M, Etzersdorfer E et. al. 2010. [Role of media reports in completed and prevented suicide: Werther v. Papageno effects](#). *Br J Psychiatry* 197(3):234–243.

Nielsen Ratings. 2021. [The Nielsen Total Audience Report: August 2020](#). Report includes data from 40,000 individuals and indicates adults > 18 years consumed on average 12:21 hours per day of entertainment-based screen content.

Northwest Evaluation Association. 2020. [How COVID-19 school closures could see math and literacy slide](#). *Science, Health And Research*.

Norwood MF, Lakhani A et. al. 2019. [A narrative and systematic review of the behavioural, cognitive and emotional effects of passive nature exposure on young people: Evidence for prescribing change](#). *Landscape and Urban Planning*. 189, 71-79.

Numata-Uematsu Y, Yokoyama H, Sato H. et al. 2018. [Attachment disorder and media exposure: neurobehavioral symptoms mimicking autism spectrum disorder](#). *The Journal of Medical Investigation*. 65;280-282.

OECD. 2015. [Students, computers and learning: Making the connection](#). *PISA, OECD Publishing*.

Office of Governor Newsom, G. (2022, September 15). Governor Newsom signs first-in-nation bill protecting children's online data and Privacy. Office of Governor Gavin Newsom. Retrieved from <https://www.gov.ca.gov/2022/09/15/governor-newsom-signs-first-in-nation-bill-protecting-childrens-online-data-and-privacy/>

Ogden CL, Carroll MD, Kit BK, et al. 2014. [Prevalence of childhood and adult obesity in the United States, 2011-2012](#). *Journal of the American Medical Association*. 311(8);806-814.

Okita, S.Y. 2013. [Self–other's perspective taking: the use of therapeutic robot companions as social agents for reducing pain and anxiety in pediatric patients](#). *Cyberpsychology, Behavior, and Social Networking*. 16(6);436-441.

Ophir Y, Shir-Raz Y. 2021. [Manipulations and spins in attention disorders research: the case of ADHD and Covid-19](#). *Ethical Human Psychology and Psychiatry*. 22(2);98-113.

Ortiz de Gortari A, Aronsson K, Griffiths M. 2011. [Game transfer phenomena in video game playing: a qualitative interview](#). *International Journal of Cyber Behavior, Psychology, and Learning*. 1(3);15-33.

Ortiz de Gortari A, Griffiths M. 2014. [Automatic mental processes, automatic actions and behavior in game transfer phenomena: an empirical self-report study using online forum data](#). *International Journal of Mental Health and Addiction*. 12(4);432-452.

Otitolaju AA, Obe A, Adewale OA, Otubanjo OA, Osunkalu VO. 2010. [Preliminary study on the induction of sperm head abnormalities in mice, *Mus musculus*, exposed to radiofrequency radiations from global system for mobile communication base stations](#). *Bulletin of Environmental Contamination and Toxicology*. 2010 Jan;84(1):51-4.

Paavonen EJ, Penonen M, Roine M. et al. 2006. [TV exposure associated with sleep disturbances in 5- to 6-year-old children](#). *Journal of Sleep Research*. 15(2);154-161.

Pagani LS, Fitzpatrick C, Barnett TA, et al. 2010. [Prospective associations between early childhood television exposure and academic, psychosocial, and physical well-being by middle childhood](#). *Archives of Pediatric and Adolescent Medicine*. 164(5);425-431.

- Pall ML. 2013. [Electromagnetic fields act via activation of voltage-gated calcium channels to produce beneficial or adverse effects.](#) *Journal of Cellular and Molecular Medicine.* 17(8);958- 965.
- Pall ML. 2015. [Microwave frequency electromagnetic fields \(EMF's\) produce widespread neuropsychiatric effects including depression.](#) *Journal of Chemical Neuroanatomy.* 75(pt.B);43-51.
- Pall ML. 2015. [Scientific evidence contradicts findings and assumptions of Canadian Safety Panel 6: microwaves act through voltage-gated calcium channel activation to induce biological impacts at non-thermal levels, supporting a paradigm shift for microwave/lower frequency electromagnetic field action.](#) *Rev Environ Health.* 30(2);99-116.
- Pall ML. 2018. [Wi-Fi is an important threat to human health.](#) *Environmental Research.* 164(2018);405-416. Panksepp J. 2008. [Play, ADHD, and the construction of the social brain: should the first class each day be recess?](#) *American Journal of Play.* 1(1);55-79.
- Park BY, Wilson G, Berger J, et al. 2016. [Is internet pornography causing sexual dysfunctions? A review with clinical reports.](#) *Behavioral Sciences (Basel, Switzerland).* 6(3);17.
- Parush S, Sohmer H, Steinberg A, et al. 2007. [Somatosensory function in boys with ADHD and tactile defensiveness.](#) *Physiology & Behavior.* 90(4);553-558.
- Patchin JW, Hinduja SK. 2016. [Bullying today: bullet points and best practices.](#) Sage Publications Corwin Press, Thousand Oaks.
- Patchin, J. W., & Hinduja, S. (2020). [Sextortion Among Adolescents: Results from a National Survey of U.S. Youth.](#) *Sexual Abuse, 32(1), 30–54.*
- Paulus MP, Squeglia LM, et. Al. 2019. [Screen media activity and brain structure in youth: Evidence for diverse structural correlation networks form the ABCD study.](#) *NeuroImage.* 185: 140-153.
- Payne Carter S, Greenberg K, Walker M. 2016. [The impact of computer usage on academic performance: evidence from a randomized trial at the United States Military Academy.](#) *Economics of Education Review.* 56;118-132.
- Przybylski, A. K. and N. Weinstein (2017). A large-scale test of the Goldilocks hypothesis. *Psychological Science*, Vol. 28/2, p. 204-215, <http://dx.doi.org/10.1177/0956797616678438>.
- Pelligrini AD, Bohn CM. 2005. [The role of recess in children’s cognitive performance and school adjustment.](#) *Educational Researcher.* 34(1);13-19.
- Pempek T, Kirkorian HL, Anderson DR. 2014. [The effects of background television on the quantity and quality of child-directed speech by parents.](#) *Journal of Children and Media.* 8(3);211-222.
- Peper E, Covell A, Matzembacker N. 2021. [How a chronic headache condition became resolved with one session of breathing and posture coaching.](#) *NeuroRegulation.* 8(4);194-197.
- Peper E. 2014. [Support healthy brain development: implications for attention deficit/hyperactivity disorder.](#)
- Petersen MC, Kube DA, Palmer FB. 2006. [High prevalence of developmental disabilities in children admitted to a general pediatric inpatient unit.](#) *Journal of Developmental and Physical Disabilities.* 18(3);307-318.
- Phillips AL. 2001. [A Walk in the Woods – Evidence builds that time spent in the natural world benefits human health.](#)

- Phillips CB. 2006. [Medicine goes to school: teachers as sickness brokers for ADHD](#). *Public Library of Science Medicine*. 3(4);e182.
- Pizzol D, Bertoldo A, Foresta C. 2016. [Adolescents and web porn: a new era of sexuality](#). *International Journal of Adolescent Medical Health*. May 1;28(2):169-73
- Poels K, Ijsselstein WA, de Kort Y. 2014. [World of Warcraft, the aftermath: how game elements transfer into perceptions, associations and \(day\)dreams in the everyday life of massively multiplayer online role-playing game players](#). *New Media and Society*. 17(7);1137-1153.
- Pollet TV, Roberts SGB, Dunbar RIM. 2011. [Use of social network sites and instant messaging does not lead to increased offline social networks size, or to emotionally closer relationships with offline network members](#). *Cyberpsychology, Behavior, and Social Networking*. 14(4);253-258.
- Porter T, Business Insider. February 26, 2021. [Facebook reported more than 20 million child sexual abuse images in 2020, more than any other company](#).
- Primack BA, Swanier B, Georgiopoulos AM, et al. 2009. [Association between media use in adolescence and depression in young adulthood: a longitudinal study](#). *Archives of General Psychiatry*. 66(2);181-188.
- Przybylski AK, Weinstein N, Murayama K. 2016. [Internet gaming disorder: investigating the clinical relevance of a new phenomenon](#). *The American Journal of Psychiatry*. 174(3);230-236.
- Przybylski AK, Weinstein N. 2017. [A large-scale test of the goldilocks hypothesis: quantifying the relations between digital-screen use and the mental well-being of adolescent](#). *Psychological Science*. 28(2);204-215.
- Przybylski AK. 2014. [Electronic gaming and psychosocial adjustment](#). *Pediatrics*. 134(3);e716-722. *Psychophysiology Today*. 9(1);4-15.
- Puterman E, Hives B, Mazara N, et al. 2021. [COVID-19 pandemic and exercise \(COPE\) trial: A multigroup pragmatic randomised controlled trial examining effects of app-based at-home exercise programs on depressive symptoms](#). *British Journal of Sports Medicine*. 2021;1-7.
- Putra IGNE, Astell-Burt T, Cliff DP, et al. 2020. [The relationship between green space and prosocial behaviour among children and adolescents: a systematic review](#). *Frontiers in Psychology*. 11;859.
- Racine N, McArthur BA, Cooke JE, et al. 2021. [Global prevalence of depressive and anxiety symptoms in children and adolescents during COVID-19. A meta-analysis](#). *JAMA Pediatr*. 175(11);1142-1150.
- Radesky JS, Kistin CJ, Zukerman B, et al. 2014. [Patterns of mobile device use by caregivers and children during meals in fast food restaurants](#). *Pediatrics*. 133(4);843-849.
- Rapport MD, Bolden J, Kofler MJ, et al. 2009. [Hyperactivity in boys with attention-deficit/hyperactivity disorder \(ADHD\): a ubiquitous core symptom or manifestation of working memory deficits?](#) *Journal of Abnormal Child Psychology*. 37(4);521-534.
- Rasmussen, M., Meilstrup, C., Bendtsen, P., Pedersen, T., Nielsen, L., Madsen, K., & Holstein, B. (2014). [Perceived problems with computer gaming and internet use are associated with poorer social relations in adolescence](#). *International Journal of Public Health*, 60(2), 179–188.

- Ratey JJ, Hagerman E. 2008. [Spark: The revolutionary new science of exercise and the brain](#). (10th ed.). *Little, Brown Spark*.
- Ratnayake K, Payton JL, Lakmal OH, et al. 2018. [Blue light excited retinal intercepts cellular signaling](#). *Scientific Reports*. 8;10207.
- Radesky JS, Kaciroti N, et. Al. 2023. [Longitudinal associations between use of mobile devices for calming and emotional reactivity and executive functioning in children aged 3 to 5 years](#). *Pediatrics*, 177(1):62-70.
- Reed, G. M., First, M. B., Billieux, J., Cloitre, M., Briken, P., Achab, S., Brewin, C. R., King, D. L., Kraus, S. W., & Bryant, R. A. (2022). [Emerging experience with selected new categories in the ICD-11: complex PTSD, prolonged grief disorder, gaming disorder, and compulsive sexual behaviour disorder](#). *World Psychiatry*, 21(2), 189–213.
- Regan KA. 2017. [Socially marginalized youths' experiences with social media and its impact on their relationships](#). *Electronic Thesis and Dissertation Repository*. 4476.
- Rehbein F, Kleimann M, Mössle T. 2010. [Prevalence and risk factors of video game dependency in adolescence: results of a German nationwide survey](#). *Cyberpsychology, Behavior and Social Networking*. 13(3);269-277.
- Reilly JJ, Jackson DM, Montgomery C, et al. 2004. [Total energy expenditure and physical activity in young Scottish children: mixed longitudinal study](#). 363(9404);211-212.
- Reinblatt SP, Riddle MA. Et al. 2006. [Selective serotonin reuptake inhibitor-induced apathy: a pediatric case series](#). *Child Adolesc Psychopharmacol*. 16(1-2);227-33.
- Restrepo A, Scheininger T, Clucas J, et al. 2020. [Problematic internet use in children and adolescents: associations with psychiatric disorders and impairment](#). *BMC Psychiatry*. 20(252);1-11.
- Ribner AD, McHarg GG. 2019. [Why won't she sleep? Screen exposure and sleep patterns in young infants](#). *Infant Behaviour and Development*. Nov;57:101334.
- Rideout VJ, Foehr UG, Roberts DF, et al. 1999. [Kids & media @ the new millennium: a comprehensive national analysis of children's media use](#). *The Kaiser Family Foundation*. November 1999;1-60.
- Rideout VJ, Vandewater EA, Wartella EA. 2003. [Zero to six: electronic media in the lives of infants, toddlers and preschoolers](#). *The Kaiser Family Foundation*. Fall 2003;1-38.
- Rine RM, Braswell J, Fisher D, et al. 2004. [Improvement of motor development and postural control following intervention in children with sensorineural hearing loss and vestibular impairment](#). *International Journal of Pediatric Otorhinolaryngology*. 68(9);1141-1148.
- Robinson JP, Martin S. 2008. [What do happy people do?](#) *Social Indicators Research*. 89(3);565-571.
- Robinson TN, Band JA, Hale L, et al. 2017. [Screen media exposure and obesity in children and adolescents](#). *Pediatrics*. 140(supp 2);S97-S101.
- Robinson TN. 1999. [Reducing children's television viewing to prevent obesity: a randomized controlled trial](#). *JAMA*. 1999; 282(16);1561-1567.
- Rodgers RF, Melioli T, Laconi S, et al. 2013. [Internet addiction symptoms, disordered eating, and body image avoidance](#). *Cyberpsychology, Behavior, and Social Networking*. 16(1);56-60.

- Rogers A, Obst S, Teague SJ, et al. 2020. [Association between maternal perinatal depression and anxiety and child and adolescent development: a meta-analysis](#). *JAMA Pediatrics*. 174(11);1082-1092.
- Rojas-Jara, C., Polanco-Carrasco, R., Navarro-Castillo, R., Faúndez-Castillo, F., & Chamorro-Gallardo, M. (2022). [Game \(not\) Over: A Systematic Review of Video Game Disorder in Adolescents](#). *Revista Colombiana de Psicología*, 31(2), 45-64.
- Rosenberg S. 2013. [Cell phones and children: follow the precautionary road](#). *Pediatric Nursing*. 39(2);65-70.
- Ross CA. 2013. [Biology and genetics in DSM-5](#). *Ethical Human Psychology and Psychiatry*. 15(3);195-198.
- Rowan C. 2010. [Unplug – don't drug: a critical look at the influence of technology on child behavior with an alternative way of responding other than evaluation and drugging](#). *Ethical Human Psychology and Psychiatry*. 12(1);60-68.
- Rowan C. January 1, 2014. [Ten reasons to NOT use technology in schools for children under the age of 12 years](#).
- Ruff, ME. 2005. [Attention deficit disorder and stimulant use: an epidemic of modernity](#). *Clinical Pediatrics*. 44(7);557-563.
- Sage C, Burgio E. 2018. [Electromagnetic fields, pulsed radiofrequency radiation, and epigenetics: how wireless technologies may affect childhood development](#). *Child Development*. 89(1);129-136.
- Sakari L, Perkinson-Gloor N, Brand S, et al. 2015. [Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms in the smartphone age](#). *Journal of Youth and Adolescence*. 44(2015);405-418.
- Saleem M, Anderson CA, Gentile DA. et al. 2012. [Effects of prosocial, neutral, and violent video games on college students' affect](#). *Aggressive Behaviour*. 38(4);263-271.
- Sampasa-Kanyinga H, Lewis RF, et al. 2015. [Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents](#). *Journal of Cyberpsychology, Behavior, and Social Networking*. 18(7);380-385.
- Sana F, Weston T, Cepeda NJ. 2013. [Laptop multitasking hinders classroom learning for both users and nearby peers](#). *Computers and Education*. 62(2013);24-31.
- Sapien Labs Report – [Age of First Smart Phone/Tablet and Mental Wellbeing as Adults](#). Retrieved from *Sapien Labs Report* May, 2023.
- Saunders TJ, Rollo S et.al. 2022. [International school-related sedentary behavior recommendations for children and youth](#). *International Journal of Behavioral Nutrition and Physical Activity*, 19:39.
- Sax L, Kautz KJ. 2003. [Who first suggests the diagnosis of attention-deficit/hyperactivity disorder?](#) *Annals of Family Medicine*. 1(3);171-174.
- Schaaf RC, Nightlinger KM. 2007. [Occupational therapy using a sensory integrative approach: a case study of effectiveness](#). *American Journal of Occupational Therapy*. 61(2);239-246.
- Schofield G. 2014. [Professor of public health, director of the human potential centre at Auckland university of technology millennium](#).

- Scholz, A., Ghadiri, A., Singh, U., Wendsche, J., Peters, T., & Schneider, S. (2018). [Functional work breaks in a high-demanding work environment: an experimental field study](#). *Ergonomics*, 61(2), 255–264.
- Schottle D, Briken P, Tuscher O, Turner D. 2017. [Sexuality in autism: hypersexual and paraphilic behavior in women and men with high-functioning autism spectrum disorder](#). *Dialogues in Clinical Neuroscience*. 2017 Dec;19(4):381-393.
- Schroeder VM, Kelley ML. 2010. [Family environment and parent-child relationships as related to executive functioning in children](#). *Early Child Development and Care*. 180(10);1285-1298.
- Seok, H. J., Lee, J. M., Park, C.-Y., & Park, J. Y. (2018). [Understanding internet gaming addiction among South Korean adolescents through photovoice](#). *Children and Youth Services Review*, 94, 35–42.
- Sherwin JC, Reacher MH, Keogh RH, et al. 2012. [The association between time spent outdoors and myopia in children adolescents](#). *Ophthalmology*. 119(10);2141-2151.
- Shih, Y. W., Hung, C. S., Huang, C. C., Chou, K. R., Niu, S. F., Chan, S., & Tsai, H. T. (2020). [The Association Between Smartphone Use and Breast Cancer Risk Among Taiwanese Women: A Case-Control Study](#). *Cancer Management and Research*, 12, 10799–10807.
- Shin S, Kim N, Jang E, et al. 2011. [Comparison of problematic internet and alcohol use and attachment styles among industrial workers in Korea](#). *Cyberpsychology, Behavior, and Social Networking*. 14(11);665-672.
- Sigman A, Matthes M. 2012. [The impact of screen media on children: a Eurovision for parliament](#). *Improving the quality of childhood in Europe 2012. (Volume 3)*;88–121. European Parliament 2010/2011 to the Working Group on the Quality of Childhood.
- Singer LM, Alexander PA. 2017. [Reading on Paper and Digitally: What the Past Decades of Empirical Research Reveal](#). *Review of Educational Research*; Vol 87, Issue 6.
- Singh A, Uijtdewilligen L, Twisk JWR, et al. 2012. [Physical activity and performance at school: A systematic review of the literature including a methodological quality assessment](#). *Arch Pediatr Adolesc Med*. 166(1);49–55.
- Singh R, Bhalla A, Lehl SS, et al. 2001. [Video game epilepsy](#). *Neurology India*. 49(4);411-412.
- Singular S. 2015. [The spiral notebook: the aurora theater shooter and the epidemic of mass violence committed by American youth](#).
- Siomos K, Floros G, Fisoun V, et al. 2012. [Evolution of Internet addiction in Greek adolescent students over a two-year period: the impact of parental bonding](#). *European Child & Adolescent Psychiatry*. 21(4);211-219.
- Sloat E, Willms JD. 2000. [The International Adult Literacy Survey: Implications for Canadian Social Policy](#). *Canadian Journal of Education*. 25(3);218-233.
- Small G, Vorgan G. 2009. [iBrain – Surviving the technological alteration of the modern mind](#). (1st ed.). *William Morrow Paperbacks*.
- Smithsonian Magazine. 2019. [A Virtual Ten-Year-Old Girl Helped Identify 1,000 Online Predators](#). Retrieved on May 11, '23.
- Solan HA, Shelley-Tremblay J, Larson S. 2007. [Vestibular function, sensory integration, and balance anomalies: a brief literature review](#). *Journal of Optometry and Vision Development*. 38(1);13-17.

- Solon O, NBC News, April 23, 2020. [Child sexual abuse images and online exploitation surge during pandemic.](#)
- SOT Events. 2021, December 28. [SOT XII - keeping creativity alive: a tribute to Sir Ken Robinson](#) [Video]. YouTube. Panel discussion with Cris Rowan, Prof Dr Ger Graus, Lord Jim Knight, Lee Daley and Afshan Khalid. Date: 20 Nov 2020. Edition XII conference titled A World of Tomorrow: From Darkness to Light.
- [Statistics Canada – Census of Population 1981 – 2011](#). Retrieved from www.12.statcan.gc.ca/census-recencement. On May 31, 2023.
- Steffgen G, König A, Pfetsch J, et al. 2011. [Are cyberbullies less empathic? adolescents' cyberbullying behavior and empathic responsiveness.](#) *Cyberpsychology, Behavior and Social Networking*. 14(11);643-648.
- Stickgold R, Malia A, Maguire D, et al. 2000. [Replaying the game: hypnagogic images in normals and amnesics.](#) *Science*. 290(5490);350-353.
- Stolzer, J. M. 2021. [Children, adolescents, and screen time: a biocultural analysis.](#) *University of Nebraska – Kearney* stolzerjm@unk.edu, 308-865-8234.
- Strauss RS, Pollack HA. 2001. [Epidemic increase in childhood overweight, 1986-1998.](#) *JAMA*. 286(22);2845-2848.
- Sudan M, Kheifets L, Arah O, et al. 2012. [Prenatal and postnatal cell phone exposures and headaches in children.](#) *The Open Pediatric Medicine Journal*. 6(2012);46-52.
- Sugiyama M, Kenji BA et. Al. 2023. [Outdoor Play as a Mitigating Factor in the Association Between Screen Time for Young Children and Neurodevelopmental Outcomes.](#) *JAMA Pediatrics*. Jan. 23, '23.
- Sum KK, Cai S, Law E, et al. 2022. [COVID-19–Related life experiences, outdoor play, and long-term adiposity changes among preschool- and school-aged children in Singapore 1 year after lockdown.](#) *JAMA Pediatr*. 2022 Jan 24;E1-E10.
- Sumner SA, Ferguson B, Bason B, et al. 2021. [Association of online risk factors with subsequent youth suicide-related behaviors in the US.](#) *JAMA Netw Open*. 4(9);e2125860.
- Sun RCF, Shek DTL. 2012. [Student classroom misbehavior: An exploratory study based on teachers' perceptions.](#) *The Scientific World Journal - Developmental Issues in Chinese Adolescents*. 2012(ID:208907); 1-8.
- Swanson JM, Elliott GR, Greenhill LL, et al. 2007. [Effects of stimulant medication on growth rates across 3 years in the MTA follow-up.](#) *Child and Adolescent Psychiatry*. 46(8);1015-1027.
- Swing EL, Gentile DA, Anderson CA, et al. 2010. [Television and video game exposure and the development of attention problems.](#) *Pediatrics*. 126(2);214-221.
- Takeuchi H, Taki Y, Hashizume H, et al. 2016. [Impact of videogame play on the brain's microstructural properties: cross-sectional and longitudinal analyses.](#) *Molecular Psychiatry*. 21(2016);1781-1789.
- Tandon PS, Zhou Ch, Lozano P, et al. 2010. [Preschoolers' total daily screen time at home and by type of child care.](#) *The Journal of Pediatrics*. 158(2);297-300.
- Tang N, Stein J, Hsia RY, et al. 2010. [Trends and Characteristics of US Emergency Department Visits, 1997-2007.](#) *JAMA*. 304(6);664-670.

- Tannock MT. 2008. [Rough and tumble play: an investigation of the perceptions of educators and young children.](#) *Journal of Early Childhood Education*. 35: 357-361.
- Taylor AF, Kuo FE, Sullivan WC. 2001. [Coping with ADD: the surprising connection to green play settings.](#) *Environment and Behavior*. 33(1);54-77.
- Taylor AF, Kuo FE. 2009. [Children with attention deficits concentrate better after a walk in the park.](#) *Journal of Attention Disorders*. 12(5);402-409.
- The Durable Human. 2021, October 5. [Learn more about virtual autism](#) [Video]. *You Tube*.
- Theruveethi N, Bui BV et. Al. 2022. [Blue Light-Induced Retinal Neuronal Injury and Amelioration by Commercially Available Blue Light-Blocking Lenses.](#) *Life*. 12(243).
- Thomas CP, Conrad P, Casler R, et al. 2006. [Trends in the use of psychotropic medications among adolescents, 1994 to 2001.](#) *Psychiatric Services*. 57(1)63-69.
- Thorn in partnership with Benenson Strategy Group. 2021. [Self-generated child sexual abuse material: Youth attitudes and experiences in 2020.](#) *Findings from 2020 quantitative research among 9–17 year olds.*
- Thornton IM. 2006. [Out of time: a possible link between mirror neurons, autism and electromagnetic radiation.](#) *Med Hypotheses*. 67(2);378-382.
- Tiggemann M, Hayden S, Brown Z, et al. 2018. [The effect of Instagram "likes" on women's social comparison and body dissatisfaction.](#) *Body Image*. 26(2018);90-97.
- Tomchek SD, Dunn W. 2007. [Sensory processing in children with and without autism: a comparative study using the short sensory profile.](#) *American Journal of Occupational Therapy*, 61(2);190-200.
- Tomczyk Ł, Solecki R. 2019. [Problematic internet use and protective factors related to family and free time activities among young people.](#) *Educational Sciences: Theory and Practice*. 19(3);1-13.
- Toombs E, et. al. 2022. [Increased Screen Time for Children and Youth During the COVID-19 Pandemic.](#) *Science Table – Covid-19 Advisory for Ontario*.
- Torres-Rodríguez A, Griffiths MD, Carbonell X. et al. 2017. [Internet gaming disorder treatment: a case study evaluation of four different types of adolescent problematic gamers.](#) *International Journal of Mental Health and Addiction*. 17(2019);1–12.
- Tremblay MS, Katzmarzyk PT, Willms JD. 2002. [Temporal trends in overweight and obesity in Canada, 1981-1996.](#) *International Journal of Obesity*. 26(4);538-543.
- Tremblay MS, LeBlanc AG, Kho ME, et al. 2011. [Systematic review of sedentary behaviour and health indicators in school-aged children and youth.](#) *International Journal of Behavioral Nutrition and Physical Activity*. 8(98);1-22.
- Tremblay MS, Willms JD. 2003. [Is the Canadian childhood obesity epidemic related to physical inactivity?](#) *International Journal of Obesity*. 27(9);1100-1105.
- Tromholt, M. 2016. [The Facebook Experiment: Quitting Facebook Leads to Higher Levels of Well-Being.](#) *Cyberpsychology, Behavior and Social Networking*. Nov;19(11):661-666.

- Turcotte M. 2007. [Time spent with family during a typical workday 1986 to 2005](#). *Statistics Canada*. Catalogue No. 11-008.
- Turner PG, Lefevre CE. 2017. [Instagram use is linked to increased symptoms of orthorexia nervosa](#). *Eat Weight Disord.* 22(2);277-284.
- Twenge JM, Campbell WK. 2019. [Media use is linked to lower psychological well-being: evidence from three datasets](#). *Psychiatric Quarterly.* 90(2019);311–331.
- Twenge JM. 2017. [Have smartphones destroyed a generation?](#) *The Atlantic*.
- Twenge JM. 2018. [Increases in depressive symptoms, suicide-related outcomes, and suicide rates among U.S. adolescents after 2010 and links to increased new media screen time](#). *Clinical Psychological Science.* 6(1);3–17.
- Twenge JM. 2019. [Age, Period, and Cohort Trends in Mood Disorder Indicators and Suicide Related Outcomes in a Nationally Representative Dataset, 2005–2017](#). *Journal of Abnormal Psychology*, Vol 128 No 3, 2019.
- Twohig-Bennett C, Jones A. 2018. [The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes](#). *Environmental Research.* 166;628-637.
- U.S. Surgeon General’s Advisory. 2021. [Protecting youth mental health: the U.S. surgeon general’s advisory](#). *Washington (DC): US Department of Health and Human Services*.
- Uhls YT, Michikyan M, Morris J, et al. 2014. [Five days at outdoor education camp without screens improves preteen skills with nonverbal emotion cues](#). *Computers in Human Behaviour.* 39(2014);387–392.
- Underwood MK, Faris R. 2015. [Being thirteen: social media and the hidden world of young adolescents’ peer culture](#). *Cable News Network.* 1-20.
- [US Census Bureau – 1975 and 2016 Current Population Survey Annual Social and Economic Supplement](#). Retrieved from www.census.gov/data. On May 31, 2023.
- US Consumer Product Safety Commission. [Is your public playground a safe place to play?](#) Public playground safety checklist. LET US PLAY campaign.
- Uzundag BC, Altundal MN, et. Al. 2022. [Screen media exposure in early childhood and its relation to children’s self-regulation](#). *Human Behavior and Emerging Technologies.* Volume 2022, ID 4490166.
- Van den Heuvel A, van den Eijnden RJJM, van Rooij Antonius J, et al. 2012. [Meeting online contacts in real life among adolescents: the predictive role of psychosocial wellbeing and internet-specific parenting](#). *Computers in Human Behavior* 28(2);465-472.
- van Geel M, Vedder P, Tanilon J. 2014. [Relationship between peer victimization, cyberbullying, and suicide in children and adolescents: a meta-analysis](#). *JAMA Pediatr.*168(5);435-442.
- Vandewater EA, Bickham DS, Lee JH, et al. 2005. [When the television is always on: heavy television exposure and young children’s development](#). *American Behavioral Scientist.* 48(5);562-577.
- Vandewater EA, Lee JH, Shim MS. 2005. [Family conflict and violent electronic media use in school-aged children](#). *Media Psychology.* 7(1);73-86.
- Varghese R, Majumdar A, Kumar G, et al. 2018. [Rats exposed to 2.45GHz of non-ionizing radiation exhibit behavioral](#)

[changes within creased brain expression of apoptotic caspase 3](#). *Pathophysiology*. 25(1);19-30

Verbanas P. 2021. [Autism rates continue to climb](#). *The Epoch Times*.

Verlenden JV, Pampati S, Rasberry CN, et al. 2021. [Association of children’s mode of school instruction with child and parent experiences and well-being during the COVID-19 pandemic — COVID experiences survey, United States, October 8–November 13, 2020](#). *Morbidity and Mortality Weekly Report*. 70;369–376.

Vidana-Perez D, Braverman-Bronstein A et. Al. 2018. [Sexual content in video games: An analysis of the Entertainment Software Rating Board classification](#). *Sexual Health*. 15(3).

Villalobos ME, Semcho S, Schuler D, et al. 2016. [Effectiveness of a novel outdoor behavioral health treatment intervention for ASD: a single subject design](#). *International Society for Autism Research*. Baltimore Convention Center Baltimore.

Viner R, Russell S, Saull R. et al. 2022. [School closures during social lockdown and mental health, health behaviors, and well-being among children and adolescents during the first COVID-19 wave: a systematic review](#). *JAMA Pediatr*. 176(4);400-409.

Viner RM, Roche E, Maguire SA, et al. 2010. [Childhood protection and obesity: framework for practice](#). *British Medical Journal*. 341;c3074.

Vitiello B, Towbin K. 2009. [Stimulant treatment of ADHD and risk of sudden death in children](#). *Journal of American Psychiatry*. 166(9);955-957.

Vogt, E. L., Jiang, C., Jenkins, Q., Millette, M. J., Caldwell, M. T., Mehari, K. S., & Marsh, E. E. (2022). [Trends in US Emergency Department Use After Sexual Assault, 2006-2019](#). *JAMA Network Open*, 5(10), e2236273–e2236273.

Vohr BR, McGowan EC, Bann C, et al. 2021. [Association of high screen-time use with school-age cognitive, executive function, and behavior outcomes in extremely preterm children](#). *JAMA Pediatr*. 175(10);1025–1034.

Volkow ND, Tomasi D, Wang GJ, et al. 2011. [Effects of cell phone radiofrequency signal exposure on brain glucose metabolism](#). *Journal of the Medical Association*. 305(8);808-813.

Voss ADO, Cash H, Hurdiss S, et al. 2015. [Case report: internet gaming disorder associated with pornography use](#). *Yale Journal of Biology and Medicine*. 88(3);319-324.

Waddell C, Hua JM, Garland O, et al. 2007. [Preventing mental disorders in children: a systematic review to inform policy-making](#). *Canadian Journal of Public Health*. 98(3);166-173.

Waddell C, Schwartz C, Barican J, et al. 2020. [COVID-19 and the impact on children's mental health](#). Vancouver, BC: Children’s Health Policy Centre, *Simon Fraser University*.

Waldinger, R. 2017. [Harvard Study of Adult Development](#) retrieved from www.adultdevelopmentstudy.org, 2023.

Walsh JJ, Barnes JD et. Al. 2018. [Associations between 24-hour movement behaviours and global cognition in US children: a cross-sectional observational study](#). *The Lancet: Child and Adolescent Health*. Vol 2, Issue 11, 783-791.

Wang CJ, Bair H. 2021. [Operational considerations on the American Academy of Pediatrics guidance for K-12 school reentry](#). *JAMA Pediatrics*. 175(2);121–122.

Ward AF, Duke K, Gneezy A, et al. 2017. [Brain drain: the mere presence of one’s own smartphone reduces available](#)

[cognitive capacity](#). *Journal of the Association for Consumer Research*. 2(2);140-154.

Ward, ML. 2016. [Media and Sexualization: State of Empirical Research, 1995-2015](#). *The Journal of Sex Research*. Vol.53, 2016 – Issue 4-5: Annual Review of Sex Research.

Ward S. 2004. [Baby talk](#). Arrow Books Ltd.

Weiss R. 2016. [Why do people with addictions seek to escape rather than connect? A look at the approach to addiction treatment](#). *Consultant 360, Multidisciplinary Medical Information Network*. 56(9);786-790.

Weisskirch RS. 2011. [No crossed wires: cell phone communication in parent-adolescent relationships](#).

Welch MG, Northrup RS, Welch-Horan TB, et al. 2006. [Outcomes of Prolonged Parent-Child Embrace Therapy among 102 children with behavior disorders](#). *Complementary Therapies in Clinical Practice*. 12(1);3-12.

Wells G, Horwitz J, Seetharaman D. 2021. [Facebook knows Instagram is toxic for teen girls, company documents show](#). *The Wall Street Journal*.

Wen Y, Alshikho MJ, Herbert MR. 2016. [Pathway network analyses for autism reveal multisystem involvement, major overlaps with other diseases and convergence upon MAPK and calcium signaling](#). *PLoS ONE*. 11(4);e0153329.

Weng CB, Qian RB, Fu XM, et al. 2013. [Gray Matter and white matter abnormalities in online game addiction](#). *European Journal of Radiology*. 82(8);1308-1312.

Whitaker JL, Bushman BJ, et al. 2011. [“Remain calm. Be kind.” Effects of relaxing video games on aggressive and prosocial behavior](#). *Social Psychological and Personality Science*. 3(1);88-92.

White MP, Alcock I, Grellier J, et al. 2019. [Spending at least 120 minutes a week in nature is associated with good health and wellbeing](#). *Scientific Reports*, 9(7730);1-11.

Wiley RW, Rapp B. 2021. [The Effects of Handwriting Experience on Literacy Learning](#). *Psychological Science* 32(7): 1086-1103.

Wilksch SM, O’Shea A, Ho P, Byrne S, Wade TD. 2020. The relationship between social media use and disordered eating in young adolescents. *International Journal of Eating Disorders*. Jan;53(1):96-106.

Willard NE. 2007. [The authority and responsibility of school officials in responding to cyberbullying](#). *Journal of Adolescent Health*. 41(6 supp. 1);S64-65.

Willoughby T, Adachi PJ, Good M. 2012. [A longitudinal study of the association between violent video game play and aggression among adolescents](#). *Developmental Psychology*. 48(4);1044-1057.

Winterstein AG, Gerhard T, Shuster J, et al. 2009. [Cardiac safety of methylphenidate versus amphetamine salts in the treatment of ADHD](#). *Pediatrics*. 124(1);e75-e80.

Wolak J, Mitchell K, Finkelho D. et al. 2007. [Unwanted and wanted exposure to online pornography in a national sample of youth internet users](#). *Pediatrics*. 119(2);247-258.

Wolf, Maryanne. [Reader Come Home – The reading brain in a digital world](#). 2018

Wolraich ML, Hagan JF, Allan C, et al. 2019. [Subcommittee on children and adolescents with attention-deficit/hyperactive disorder. Clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents](#). *Pediatrics*. 144(4);e20192528.

WorkSafe BC. 2022. [Handle with Care – Patient Handling and the Application of Ergonomic \(MSI\) Requirements](#). Free download retrieved from www.worksafebc.com, April 2023.

WorkSafe BC. 2022. [Preventing Musculoskeletal Injury – A guide for employers and joint committees](#). Free download retrieved from www.worksafebc.com, April 2023.

WorkSafe BC. 2022. [Understanding the Risk of Musculoskeletal Injury \(MSI\) – An educational guide for workers on sprains, strains and other MSI's](#). Free download retrieved from www.worksafebc.com, April 2023.

World Health Organization. 2014. [Global Strategy on Diet, Physical Activity and Health. Facts and Figures on Childhood Obesity](#).

World Health Organization. May 31, 2011. [Press release no. 208: IARC classifies radiofrequency electromagnetic fields as possibly carcinogenic to humans](#). *International Agency for Research on Cancer*.

[World Health Organization, ICD-11: International Statistical Classification of Diseases and Related Health Problems \(2019\)](#). Geneva.

Worth KA, Gibson Chambers J, Nassau DH, et al. 2008. [Exposure of US adolescents to extremely violent movies](#). *Pediatrics*. 122(2);306-312.

Worthen MR. 2007. [Education policy implications from the Expert Panel on Electronic Media and Youth Violence](#). *Journal of Adolescent Health*. 41(6 supp. 1);S61-63.

Wright PJ, Tokunaga RS and Kraus A. 2015. [A Meta-Analysis of Pornography Consumption and Actual Acts of Sexual Aggression in General Population Studies](#). *Journal of Communication*. Dec. 29, 2015.

Wu X, Tao E, Rutayusire et al. 2017. [The relationship between screen time, nighttime sleep duration, and behavioural problems in preschool children in China](#). *European Child & Adolescent Psychiatry*. 26;541-548.

Xiuqin H, Huimin Z, Mengchen L, et al. 2010. [Mental health, personality, and parental rearing styles of adolescents with internet addiction disorder](#). *Cyberpsychology, Behavior, and Social Networking*. 13(4);401-406.

Ybarra ML, Diener-West M, Leaf PJ. 2007. [Examining the overlap in internet harassment and school bullying: implications for school intervention](#). *Journal of Adolescent Health*. 41(6 supp. 1);S42-S50.

Ybarra ML, Mitchell KJ. et al. 2005. [Exposure to internet pornography among children and adolescents: a national survey](#). *Cyberpsychology & Behaviour*. 8(5);473-486.

Yen JY, Yen CF, Chen CS. 2009. [The association between adult adhd symptoms and internet addiction among college students: the gender difference](#). *CyberPsychology & Behavior*.

Yeo YH, Wang M e. al. 2022. [Excess risk for acute myocardial infarction mortality during the Covid-19 pandemic](#). *Journal of Medical Virology*. Vol 95, Issue 1.

Young J, Pritchard R, Nettle C, et al. 2020. [Pets, touch, and COVID-19: health benefits from non-human touch through times of stress](#). *Journal of Behavioral Economics for Policy*. 4(2);25-33.

Young KS. 2013. [Treatment outcomes using CBT-IA with Internet-addicted patients](#). *Journal of behavioral Addictions*. 2(4);209-215.

- Yuan K, Cheng P, Dong T, et al. Jan, 2013. [Cortical thickness abnormalities in late adolescence with online gaming addiction.](#) *PLoS ONE*. 8(1);e53055.
- Yuan K, Jin C, Cheng P, et al. Nov, 2013. [Amplitude of low frequency fluctuation abnormalities in adolescents with online gaming addiction.](#) *PLoS ONE*. 8(11);e78708.
- Yuan K, Qin W, Wang G, et al. 2011. [Microstructure abnormalities in adolescents with internet addiction disorder.](#) *PLoS ONE*. 6(6):e20708.
- Zack E, Gerhardstein P, Meltzoff AN, et al. 2013. [15-month-olds' transfer of learning between touch screen and real-world displays: language cues and cognitive loads.](#) *Scandinavian Journal of Psychology*. 54(1);20-25.
- Zamfir MT. 2018. [The consumption of virtual environment more than 4 hours/day, in the children between 0-3 years old, can cause a syndrome similar with the autism spectrum disorder.](#) *Journal of Literary Studies*. 13.
- Zhang C, Spence O, Reeves G, et al. 2021. [Characteristics of youths treated with psychotropic polypharmacy in the United States, 1999 to 2015.](#) *JAMA Pediatrics*. 175(2);196–198.
- Zhang JP, Zhang KY, Guo L, et al. 2017. [Effects of 1.8 GHz radiofrequency fields on the emotional behavior and spatial memory of adolescent mice.](#) *Environmental Research and Public Health*. 14(11);1344.
- Zhang L, Wang W, Dong X, et al. 2020. [Association between time spent outdoors and myopia among junior high school students.](#) *Medicine*. 99(50): e23462.
- Zhao Z-C, Zhou Y, et. Al. 2018. [Research progress about the effect and prevention of blue light on eyes.](#) *International Journal of Ophthalmology*. 11(12):1999-2003.
- Zhao F, Egelman S, Weeks HM, et al. 2020. [Data collection practices of mobile applications played by preschool-aged children.](#) *JAMA Pediatr*. 174(12);e203345.
- Zhou Y, Lin FC, Du YS, et al. 2011. [Gray matter abnormalities in internet addiction: a voxel-based morphometry study.](#) *European Journal of Radiology*. 79(1);92–95.
- Zimmerman FJ, Christakis DA, Meltzoff AN. 2007. [Television and DVD/video viewing in children younger than 2 years.](#) *Archives of Pediatric Adolescent Medicine*. 161(5);473-479.
- Zito JM, Safer DJ, dosReis S, et al. 2000. [Trends in the prescribing of psychotropic medications to preschoolers.](#) *JAMA*. 283(8);1025-1030.
- Zito JM, Safer DJ, DosReis S, et al. 2002. [Rising prevalence of antidepressants among US youths.](#) *Pediatrics*. 109(5);721-727.
- Zito JM, Safer DJ, DosReis S, et al. 2003. [Psychotropic practice patterns for youth: a 10-year perspective.](#) *Archives of Pediatric and Adolescent Medicine*. 157(1);17-25.