Review Clarace Review charace First Author	teristics		Review for meta-analyses provid Regions Restrictions		Sample Age Restrictions (Age Range) <sup>1</sup>	C	Outcomes Assessed  Literacy: Listening comprehension	E	Exposures Assessed
Abrami Adelantado		Include: Experimental designs Include: Cross-	None specified  None specified	2009–2019 1982–2019	Pre K to Grade 3  Children;	•	Literacy: Phonics Literacy: Phonomic awareness Literacy: Reading comprehension Literacy: Reading fluency Literacy: Vocabulary knowledge  Learning: General Literacy: General	•	Intervention: Literacy (Abracadabra; in schools)  Screen use: General TV programs and movies:
Renau Aghasi Andrade	2019	Include: Observational Include: Include: Interventions	None specified  None specified	1982–2019 2007–2016 2010–2017	(5.7-18.0)  All (14.2-15.8)  Children; Adolescents	•	Body composition  Healthy behavior: Self-efficacy Psychological health: Depression Psychological health: Enjoyment Self-perceptions: General Self-perceptions: Self-esteem	•	General Video games: General Internet use: General Video games: Physically active
Arztmann Aspiranti	2022	None specified Include: Interventions	None specified  None specified	2008–2020 2013–2015	K - Grade 8 School-age	•	Learning: Behavior Learning: Motivation Learning: General		Video games: Educational (with competition)  Intervention: Education (via touch screen)
Baradaran Mahdavi Bartel	2021	Include: Observational Exclude: Experimental None	None specified  None specified	1999–2019 2004–2014	(9.0-16.0) Adolescents	•	Physical health: Lower back pain  Sleep: Bedtime Sleep: Duration	•	Screen use: General (excluding TV) TV programs and movies: General  Computer use: General Internet use: General Screen use: General (mobile phone)
Beck Silva Benavides- Varela	2022	Include: Randomised controlled trials and quasi-RCTs. Include: Randomised	None specified  None specified	1999–2019 2006–2018	10 - 19 years	•	Sleep: Time to fall asleep  Diet: Fat consumption  Numeracy: Mathematics	•	TV programs and movies: General Video games: General Intervention: Nutrition (in schools) Intervention: Mathematics
Blok Bossen		controlled trials  None  Include: Randomised controlled trials	None specified  None specified	1990–2000 2011–2018	(5.4-11.5)  Children (10.0-15.7)	•	Literacy: Reading fluency  Body composition Cardiometabolic health: Fitness Physical activity: General Physical health: Muscular fitness		Intervention: Literacy  Video games: Health promoting content
Boyland Byun	2016 2018	Include: Experimental Include: All quantitative designs	None specified  None specified	2004–2015 2006–2014	(6.0-10.4) School-age Children	•	Diet: Food intake  Numeracy: General  Cognition: Executive		Advertising: Unhealthy food  Video games: Numeracy
Cao	2020	Include: designs with control groups	None specified	2002–2019	3-12 years (3.4-14.3)	•	functioning Cognition: Executive Functioning (cognitive flexibility) Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working memory)	•	Computer use: Executive functioning training
Carter	2016	Include: All quantitative designs Include:	None specified	2011–2015	Adolescents (10.6-17.0)	•	Sleep: Inadequate duration Sleep: Lethargy Sleep: Poor quality  Body composition Diet: Fat consumption Diet: Fruit and vegetable intake Diet: Fruit intake Diet: Sugary drinks and snacks	•	Screen use: General (mobile phone at bed time)
Chan		Randomised controlled trials  Include: Experimental;	None specified	2003-2017	Children (11.4-15.9)	•	Physical activity: General Physical activity: Moderate-to- vigorous intensity Risky behavior: Alcohol consumption Risky behavior: Smoking Screen time: General		Intervention: Lifestyle risk behaviour (at school)  Intervention: Dynamic
Chauhan Chen	2014 2017	Quasi- experimental Include: pre-post designs with or without control group Include: Experimental designs	None specified  None specified  None specified	2002–2012 2001–2016 2008–2019	Children  Elementary school students	•	Numeracy: General  Learning: General  Learning: General	•	geometry software  Screen use: General (in schools)  Video games: Educational (with competition)
Cheung Cheung	2012	Include: Randomised controlled trials Include: Experimental; Quasi- experimental Include:	None specified  None specified	1982–2010 1980–2010	School-age		Literacy: Reading  Numeracy: General		Intervention: Reading (in schools)  Intervention: Mathematics (in schools)
Cho Claussen Clinton	2018 2022	experiemental designs with control group Include: Longitudinal; Retrospective Include: randomised	None specified  None specified  None specified	2008–2013 2004–2018 2011–2016	None specified  None	•	Psychological health: ADHD Psychological health: ADHD Symptoms (Inattention)  Literacy: Reading performance	•	Screen use: General (mobile phone for language learning)  Screen use: General  Screen use: Reading (vs.paner)
Comeras- Chueca	2021	experimental designs include: randomized and non-randomized controlled trials (control group with no intervention or traditional exercise intervention)	None specified	2008–2019	Under 18	•	Body composition: BMI Cardiometabolic health: Fitness		Video games: Physically active
Comeras- Chueca	2021	Include: randomized and non-randomized controlled with control group with no intervention or traditional exercise intervention	None specified	2010–2020	Under 18 (8.0-14.0)	•	Body composition: BMI Body composition: BMI z-score Body composition: Body fat percentage Body composition: Fat-free mass Body composition: Waist circumference	•	Video games: Physically active
Coyne  Cushing  Darling		None Include: All quantitative designs; Experimental Include:	None specified  None specified	1975–2017 1989–2009 2006–2016	Children; Adolescents  Children;	•	Prosocial Behavior: General  Healthy behavior: General  Body composition Diet: Healthy dietary behaviour	•	Screen use: Prosocial content  Intervention: Health behaviours  Intervention: To promote health
Eirich	2022	Include: Cobort:	None specified	1978–2021	(8.7-16.0) (8.7-16.0) (9.7-16.0) (9.7-16.0)	•	Physical activity: General  Psychological health: Externalizing Psychological health: Internalizing		(via mobile phone)  Screen use: General  Computer use: General
Fang Feng		Include: Cohort; Case-control; Cross-sectional  Include: Quantitative designs	None specified  None specified	2006–2019	1 month - 4.99 years old	•	Body composition  Body composition: BMI z-score  Risky behavior: Sexual activity	•	Screen use: General TV programs and movies: General  Screen use: General (meeting guidelines)
Ferguson Ferguson Folkvord	2020	None Include: Experimental, correlational, or longitudinal Include: Interventions	None specified  None specified  None specified	2005–2017 2009–2013 2007–2018	None specified (7.8-17.5)	•	Risky behavior: Sexual activity (initiation of sex)  Agression: General  Diet: Food intake (calories)	•	Screen use: Sexual content  Video games: Violent content  Advertising: Advergames
Foreman Furenes	2021	Include: observational and intervention studies Include: experimental or quasi-experimental	None specified  None specified	2015–2020 2002–2019	None specified	•	Eye health: Myopia  Literacy: Reading comprehension Literacy: Vocabulary learning	•	Screen use: General Screen use: General (phone or tablet) e-Books: General
Gardella Garzón	2017	Include: Cross- sectional  Include: Experimental with control group Include: Cohort;	Include: North America None specified	2006–2014 NA	Adolescents (12.5-16.2)	•	Learning: Educational achievement problems Learning: School attendance problems  Learning: General		Internet use: Cyberbullying victimization  Intervention: Augmented reality (in schools)
Ghobadi Graham	2015	Case-control; Cross-sectional Exclude: Interventions Include: Experimental; Quasi- experimental Include:	None specified  None specified	2009–2014 2004–2011	School-age Children (Primary/Elements	•	Body composition  Literacy: Writing		TV programs and movies: Mealtime  Intervention: Writing feedback
Haghjoo Hammersley Hao	2016	observational designs  Include: Randomised controlled trials  Include: Experimental with	None specified  None specified	2008–2021 2003–2013 2012–2018	old Children; Adolescents	•	Body composition: Overweight/obesity  Body composition  Learning: Second language vocabulary	•	Screen use: General  Intervention: To promote healthy weight (obesity prevention)  Intervention: English as foreign language
Hao Hassan- Saleh He		Experimental with control group Include: Experimental; Quasi- experimental Include: Randomised controlled trials	None specified  None specified  None specified	2012–2018 2008–2016 2009–2018	Children; Adolescents	•		•	
Hernandez- Jimenez Hurwitz		Include: Experimental; Quasi- experimental	None specified  Include: North America	2009–2017 1997–2018	Early childhood/pre-		Body composition  Literacy: General		Video games: Physically active  Intervention: Literacy videos
lvie Janssen	2020	Include: Correlational studies Include: Experimental; Cross-sectional; Longitudial	None specified  None specified	2012–2019 2007–2019	Primary/Elemen 11-18 years (14.0-18.0)	•	Psychological health: Depression Sleep: Duration		Social Media: General  Screen use: General
Kates Kim	2021	None  Include: experimental or quasi-experimental Include: Within	None specified  None specified	2008–2016 2010–2018	Preschool to Grade 3 (3-9 years old)  School-age	•	Learning: General  Learning: Literacy and numeracy Literacy: General Numeracy: General	•	Screen use: General (mobile phone)  Screen use: Educational apps
Kroesberge Kucukalkan	2019	subject design; between subject design Include: Experimental Include: Cohort; Case-control; Cross-sectional; Intervention trials.	None specified  None specified	1985–1999 2007–2016	(7.0-11.3) School-age Children (Primary/Elemen	•	Numeracy: General  Numeracy: General	•	Intervention: Mathematics (via computer in classrooms)  Intervention: Mathematics
Lanca Li	2020	Exclude: Case reports; Retrospective studies. Include: Experimental; Quasi-experimental	None specified  None specified	2007–2016 1991–2005	Adolescents  School-age Children	•	Numeracy: General  Body composition:		Screen use: General  Intervention: Mathematics
Li Li		None specified  Include: Randomised controlled trials	None specified  None specified	2005–2019	toddlers, and preschoolers (0-7 years)	•	Body composition: Overweight/obesity Sleep: Duration  Developmental: Gross motor (locomotor) Developmental: Gross motor (non-locomotor) Developmental: Gross motor		Screen use: General  Intervention: Active video games for motor skills
Li Liao		Include: experimental or quasi-experimental Include: All quantitative designs	None specified Include: Taiwan	2014–2021 1990–2003	specified  School-age Children (Primary/Elemen	•	(object control skills)  Learning: Computational thinking  Learning: General		Computer use: Programming exercises  Intervention: Education (via computer)
Liao Liu	2014	Include: Randomised controlled trials Include: Cross- sectional; Case- control; Longitudinal	None specified  None specified	1999–2012 2001–2014	(4.0-14.7) All (10.9-18.0)	•	Psychological health:  Psychological health:  Psychological health:  Psychological health:	•	Intervention: Screentime reduction  Screen use: General
Liu Liu Liu		Include: All quantitative designs  Include: studies with control group  Include: Observational	None specified  None specified  None specified	2007–2014 NA 2012–2021	All (13.3-16.6)  None specified	•	Psychological health: Depression Psychological health: Satisfaction  Cognition: Creativity  Psychological health: Depression	•	Social Media: Instant messaging Video games: General  Screen use: General  Social Media: General (duration)
Lu	2021	Observational Include: Cross- sectional only	China	2012–2021	Adolescents	•	Psychological health: Negative coping style Psychological health: Positive coping style	•	Screen use: General (mobile phone addiction)  Intervention: Education (general)
Madigan	2020	Include: Observational Exclude: Qualitative	None specified	1973–2019	Children (0.5-10.6)	•	Literacy: General	•	Screen use: General Screen use: General (coviewing) TV programs and movies: Coviewing TV programs and movies: Educational TV programs and movies: General TV programs and movies: General TV programs and movies:
Мајог	2021	Include: Randomised controlled trials	Low- or middle- income per World Bank	2007–2020		•	Learning: General  Cognition: Cognitive Functioning Cognition: Executive Functioning Developmental: General	•	Intervention: Literacy (Abracadabra; in schools)
Mallawaarad	2022	Include: Cross- sectional or longitudinal	None specified	2014–2020	prior to school entry (1.4-5.4)	•	_	•	Screen use: General (mobile phone or tablet)
Mares Mares	2005	None  Exclude: Experimental	None specified  Exclude: North America	1969–1989 1973–2010	Children	•	Cognition: Reducing stereotypes Prosocial Behavior: Altruism Social interactions: General  Cognition: Moral reasoning and perception of out-groups Learning: General Learning: Literacy and numeracy		TV programs and movies: General Intervention: Sesame Street
Marker Marshall	2022	Experimental  None specified  None	America  None specified  None specified	1973–2010 2001–15 1985–2002	None specified (6.0-12.2)	•		•	Video games: General  TV programs and movies: General Video games: General
Martins Martins		Include: All quantitative designs Include: Cross-over or parallel randomized controlled trials	None specified  None specified	2003–2018 2006–2017	All	•	Aggression: Towards peers  Diet: Food intake (calories)	•	Screen use: General  TV programs and movies: Mealtime
Mazeas  McArthur	2022 2012	Include: Randomised controlled trials  Include: Randomised controlled trials and quasi-RCTs. Include: Randomised	None specified  None specified  Include: English	2015–2019 1994–2009	(10.3-17.8)  All (6.7-16.2)  Children;	•	Physical activity: General  Literacy: Phonics  Literacy: General	•	Intervention: To promote physical activity (via gamification)  Intervention: Literacy (phonics; via computer)
McArthur Mei	2018	Randomised controlled trials and quasi-RCTs. Include: cross-sectional, case-control, and cohort studies Include:	Include: English speaking countries  None specified	1994–2015 2004–2018	Adolescents  11-20 (13.5-16.8)	•	Sleep: Duration Sleep: Problems Sleep: Time to fall asleep	•	Screen use: General (excessive)  Screen use: Virtual reality simulations (Educational)
Merchant	2014	Include: Experimental with control group	None specified	NA		•	Psychological health: Internalizing Risky behavior: Alcohol consumption		simulations (Educational) Screen use: Virtual reality worlds (Educational) Video games: Virtual reality (Educational)
Могі	2019	None specified	None specified  Include: United	2013–2018	<18 years (12.3-16.7)	•	consumption Risky behavior: Delinquency Risky behavior: Drug use Risky behavior: Sexual activity Risky behavior: Sexual activity (contraception use) Risky behavior: Sexual activity (multiple partners) Risky behavior: Smoking		Screen use: Sexting
Neitzel Oldrati	2022	Include: random assignment or quasi-experimental  Include: Group-control experimental design	Include: United States,Europe, Israel, Australia, and New Zealand  None specified	2004–2020	School-age Children	•	Literacy: Reading  Cognition: Cognitive Functioning Cognition: Executive Functioning Cognition: Verbal skills Cognition: Visuospatial skills		Intervention: Reading (technology supported)  Intervention: Cognitive training
Paik Pearce		experimental design  None  Include: All quantitative	None specified  None specified	NA 1986–2012	Children; Adolescents Children;	•	Cognition: Visuospatial skills Numeracy: General Psychological health: Adjustment  Antisocial Behaviour: General  Psychological health:	•	TV programs and movies: Violent content  TV programs and movies: Scary
Pearce			None specified  None specified	1986–2012 2001–2010	Adolescents  Children; Adolescents	•	Psychological health: Internalizing  Cardiometabolic health: Maximum oxygen consumption Physical activity: Energy expenditure Physical activity: Heart rate	•	video games: Physically active
Poorolajal Powers Prescott	<ul><li>2020</li><li>2013</li><li>2018</li></ul>	Include: Observational  Include: Experimental or quasi-experimental designs Include: Longitudinal	None specified  None specified	1995–2018 1985–2012 2008–2017	None specified	•	Body composition  Cognition: Information processing  Aggression: Towards peers	•	TV programs and movies: General Video games: General  Video games: General
Reynard Rodriguez-		None specified  Include: Experimental;	None specified  None specified	2008–2017 2016–2020	(8.9-16.0) 8-14 years	•	Psychological health: Emotion experience Psychological health: Emotion regulation  Diet: Fruit and vegetable intake	•	Intervention: To improve emotional regulation Intervention: To improve emotional regulation (via digital games)  Intervention: Fruit and
Rocha  Sadeghirad  Scherer		Experimental; Quasi- experimental Include: Randomised controlled trials Include: Experimental or quasi-experimental designs Include:	None specified  None specified  None specified	1999–2018 1978–2014 1973–2017	(4.5-15.4)  Children; Adolescents (3.8-11.0)  None	•	Diet: Fruit and vegetable intake  Diet: Unhealthy food choice  Learning: Programming skills	•	vegetable  Advertising: Unhealthy food  Intervention: Education (programming)
Schroeder Scionti	2013	Experimental; Quasi- experimental Include: Interventions	None specified  None specifed	2001–2009	Children:	•	Learning: General  Cognition: Executive functioning  Body composition	•	Intervention: With digital characters  Intervention: Cognitive training  Intervention: To promote health (via mobile phone app)
Shin Slavin	2019	Include: Interventions  Include: Randomised controlled trials; Quasi- experimental;	None specified  None specified	2013–2018	Adolescents (12.0-15.7)  School-age	•	Body composition Diet: Sugary drinks Physical activity: General Screen time: General Science: General	•	(via mobile phone app) Intervention: To promote health (via mobile phone) Intervention: To promote health (via text message)  Intervention: Science (in schools)
Strouse Takacs	2021	experimental; Observational Include: experimental and quasi-experimental designs Include: Experimental; Quasi-	None specified  None specified	1994–2019 1980–2014	Average 6 years, all must be less than 8 years (0.8-6.5)	•	Learning: General Learning: General		Screen use: Video (vs face-to-face) e-Books: Narration
Takacs	2019	experimental  Include: Randomised controlled trials and quasi-RCTs.	None specified	2001–2016	Children	•	Cognition: Executive Functioning (accuracy) Cognition: Executive Functioning (cognitive flexibility) Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working memory)	•	Intervention: Education (via computer)
Tekedere Tokac		None Include: desgins with a control group Include:	None specified  None specified	2010–2015 2006–2016	All PreK-12th grade	•	Functioning (working memory)  Learning: General  Numeracy: Mathematics		Intervention: Augmented reality (in schools)  Video games: Educational
Vahedi Vannucci		Interventions (pre-	None specified  None specified	2015–2016	Children (Middle/High School) Adolescents (12.6-18.0)	•	Risky behavior: Media literacy Risky behavior: Risk taking (attitude)  Risky behavior: Risk taking (general) Risky behavior: Risky sexual behaviour Risky behavior: Substance abuse	•	Intervention: Media literacy (web-based)  Social Media: General
Wang Wouters	2020	Include: longitudinal, cohort, case- control, cross- sectional, or controlled trials Include: experimental designs	None specified  None specified	2016–2020	<=18 years (9.5-16.8)	•	Risky behavior: Substance abuse  Eye health: Visual impairment  Learning: Motivation	•	Screen use: General (mobile phone)  Video games: Educational
Wouters  Xie	2013	designs Include: Experimental with control group Include: Experimental; Quasi- experimental; Pretest post-test	None specified  None specified	1993–2007 2010–2018	None specified	•	Learning: General  Learning: General	•	Video games: Educational (with instructional support)  Intervention: Education (via touch screen)
Xie Yin		Include: experimental, quasi- experimental, or pre-post test  None specified	None specified  None specified	2010–2018	(1.8-5.8) None	•	Learning: General  Psychological health: General Psychological health: Positive mental health		Screen use: Touchscreens  Social Media: General
Zhang Zhang		Include: Cohort; Case-control; Cross-sectional Include: longitudinal or cohort designs	None specified  None specified	2001–2014	2-19 years (3.8-17.1)	•	Body composition  Psychological health: Other mental health problems  Body composition Cardiometabolic health: Poor		TV programs and movies: General Screen use: General
Zhang Zhou	2022	Include: Observational or experimental designs  Exclude: Non- empirical studies; Oualitative:	Mainland China, Hong Kong, Macau and Taiwan	2009–2020	6-18 years (or grade 1-12)	•	Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Eye health: Myopia Physical health: Health Issues Psychological health: Emotion problems  Healthy behavior: General		Screen use: General  Video games: Health promoting
Zhou Zou	2020	Qualitative; Systematic reviews or meta-analyses  Include: observational cross-sectional, case-control, or longitudinal designs	None specified  None specified	2009–2018	All	•	Healthy behavior: General Healthy behavior: Self-efficacy Psychological health: Enjoyment  Psychological health: Depression	•	Computer use: General Screen use: General Screen use: General (mobile phone) TV programs and movies: General
Zucker	2009	_	None specified	1997–2006	Children (Primary/Eleme	•	Literacy: Decoding Literacy: Reading comprehension  Cardiometabolic health:	•	Video games: General e-Books: General
de Oliveira <sup>1</sup> Where prov	2016 ided	Include: Observational	None specified	2010–2014	Adolescents	•	Cardiometabolic health: Metabolic Syndrome	•	Screen use: General