Review Characterists First Author	Year	teristics and quality assessment Design Restrictions			•	Outcomes Assessed Exposures Assessed Literacy: Listening comprehension Literacy: Phonics
Abrami Adelantado Renau	2020	Include: Experimental designs Include: Cross- sectional studies	None specified None specified	2009–2019 1982–2019	Pre K to Grade 3 Children; Adolescents	Literacy: Phonomic awareness Literacy: Reading comprehension Literacy: Reading fluency Literacy: Vocabulary knowledge Learning: General Literacy: General Literacy: General Ceneral Intervention: Literacy (Abracadabra; in schools) Screen use: General TV programs and movies: General
Renau Aghasi Andrade	2020	Include: Observational Include: Include: Interventions	None specified None specified	2007–2016	(5.7-18.0) All (14.2-15.8) Children; Adolescents	Numeracy: General Body composition Healthy behavior: Self-efficacy Psychological health: Depression Psychological health: Enjoyment Self-perceptions: General Self-perceptions: Self-esteem
Arztmann Aspiranti		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 specified None specified	1999–2019 2004–2014	(9.0-16.0)	 Physical health: Lower back pain TV) TV programs and movies: General General Computer use: General Internet use: General Screen use: General phone
Beck Silva Benavides-	2022	Include: Randomised controlled trials and quasi-RCTs. Include:	None specified	1999–2019	10 - 19 years •	 Sleep: Time to fall asleep TV programs and movies: General Video games: General Diet: Fat consumption Intervention: Nutrition (in schools)
Varela Blok Bossen	2002	Randomised controlled trials None Include: Randomised controlled trials	None specified None specified None specified	2006–2018 1990–2000 2011–2018	All (5.4-11.5) Children (10.0-15.7)	Cardiometabolic health: Fitness Physical activity: General Physical health: Muscular Video games: Health promoting content
Boyland Byun	2016	Include: Experimental Include: All quantitative designs	None specified None specified	2004–2015 2006–2014	(6.0-10.4) School-age Children	Diet: Food intake • Advertising: Unhealthy food • Numeracy: General • Video games: Numeracy • Cognition: Executive
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)
Carter	2016	Include: All quantitative designs	None specified	2011–2015	Adolescents (10.6-17.0)	Diet: Fat consumption Diet: Fruit and vegetable intake Diet: Fruit intake
Champion	2019	Include: Randomised controlled trials Include:	None specified	2003–2017	Children (11.4-15.9)	 Diet: Sugary drinks and snacks Physical activity: General Physical activity: Moderate-to-vigorous intensity Risky behavior: Alcohol consumption Risky behavior: Smoking Screen time: General
Chauhan Chen	2014	Experimental; Quasi- experimental Include: pre-post designs with or without control group Include: Experimental	None specified None specified None specified	2002–2012 2001–2016 2008–2019	Elementary school students	 Numeracy: General Learning: General Screen use: General (in schools) Learning: General Video games: Educational (with competition)
Cheung Cheung	2012	designs Include: Randomised controlled trials Include: Experimental; Quasi- experimental Include:	None specified None specified	1982–2010 1980–2010	School-age School-age	 Literacy: Reading Intervention: Reading (in schools) Numeracy: General Intervention: Mathematics (in schools)
Cho Claussen	2018	experiemental designs with control group Include: Longitudinal; Retrospective Include: randomised	None specified None specified	2008–2013	None	 Learning: Second language Screen use: General (mobile phone for language learning) Psychological health: ADHD Symptoms (Inattention) Screen use: General (mobile phone for language learning) Screen use: General (mobile phone for language learning)
Clinton Comeras- Chueca	2021	experimental designs include: randomized and non-randomized controlled trials (control group with no intervention or traditional exercise	None specified None specified	2011–2016	specified Under 18	Body composition: BMI Cardiometabolic health: Fitness Screen use: Reading (vs paper) Video games: Physically active
Comeras- Chueca	2021	intervention) 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
Coyne	2010	None Include: All quantitative designs; Experimental Include:	None specified None specified	1975–2017 1989–2009	Children; Adolescents Children;	 Prosocial Behavior: General Healthy behavior: General Intervention: Health behaviours Body composition Diety Healthy dietyry behavious Intervention: To promote health
Darling Eirich	2017	Intervention Include: experimental or observational	None specified None specified	2006–2016 1978–2021	(8.7-16.0) • 12 or under	Physical activity: General Psychological health: Externalizing Psychological health: Internalizing (via mobile phone) Screen use: General
Fang Feng	2019	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 TV programs and movies: General Body composition: BMI z-score Screen use: General (meeting guidelines)
Ferguson Ferguson Folkvord	201720202018	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) Agression: Sexual activity (video games: Violent content) Advertising: Advergames
Foreman	2021	Interventions Include: observational and intervention studies Include: experimental or quasi-experimental	None specified None specified	2007–2018 2015–2020 2002–2019	None specified 1-8 years old	 Screen use: General Screen use: General (phone or tablet) Literacy: Reading comprehension Literacy: Vocabulary learning
Gardella Garzón	2017	Include: Cross-sectional Include: Experimental with control group	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	2018	Include: Cohort; Case-control; Cross-sectional Exclude: Interventions Include: Experimental; Quasi- experimental	None specified None specified	2009–2014	Children:	 Body composition Literacy: Writing TV programs and movies: Mealtime Intervention: Writing feedback
Haghjoo Hammersley	2022	Include: observational designs Include: Randomised controlled trials Include:	None specified None specified	2008–2021	10-20 years old Children; Adolescents	 Body composition: Overweight/obesity Screen use: General Intervention: To promote healthy weight (obesity prevention) Learning: Second language Intervention: English as foreign
Hao Hassan- Saleh He	2021 2019	Experimental with control group Include: Experimental; Quasi- experimental Include: Randomised	None specified None specified	2012–2018 2008–2016 2009–2018	Children; Adolescents	 Learning: Second language vocabulary Literacy: Pronunciation Intervention: English as foreign language Intervention: Pronunciation Intervention: To promote physical activity: General phone)
Hernandez- Jimenez Hurwitz		controlled trials Include: Experimental; Quasi- experimental None	None specified Include: North America	2009–2017 1997–2018	Children; Adolescents Early childhood/pre- school; School-	phone) Body composition • Video games: Physically active Literacy: General • Intervention: Literacy videos
lvie Janssen	2020	Include: Correlational studies Include: Experimental; Cross-sectional;	None specified None specified	2012–2019	(Early Primary/Elemen 11-18 years (14.0-18.0)	
Kates Kim	2021	Include: experimental or quasi-experimental	None specified None specified	2008–2016	Preschool to Grade 3 (3-9 years old)	• Screen use: General (mobile phone) Learning: Literacy and numeracy Literacy: General • Numeracy: General • Screen use: Educational apps
Kroesberge Kucukalkan	2019	Include: Within subject design; between subject design Include: Experimental Include: Cohort; Case-control; Cross-sectional;	None specified None specified	1985–1999 2007–2016	(7.0-11.3) School-age	 Numeracy: General Intervention: Mathematics (via computer in classrooms) Numeracy: General Intervention: Mathematics
Lanca Li	2010	Intervention trials. Exclude: Case reports; Retrospective studies. Include: Experimental; Quasi- experimental	None specified None specified	2007–2016	School-age	 Eye health: Myopia Screen use: General Numeracy: General Intervention: Mathematics
Li Li	2022	None specified Include: Randomised controlled trials	None specified None specified	2005–2019	preschoolers	(non-locomotor) games for motor skills
Li Liao	2022	Include: experimental or quasi-experimental Include: All quantitative designs	None specified Include: Taiwan	2014–2021	specified School-age	Developmental: Gross motor (object control skills) Learning: Computational thinking • 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	Children; Adolescents (4.0-14.7) All (10.9-18.0)	 Body composition Psychological health: Depression Intervention: Screentime reduction Screen use: General
Liu Liu	2019	Include: All quantitative designs Include: studies with control group	None specified None specified	2007–2014 NA	All (13.3-16.6) None specified	Psychological health: Anxiety Psychological health: Depression Psychological health: Satisfaction Cognition: Creativity Psychological health: Psychological health: Psychological health:
Liu Lu	2022	Include: Observational Include: Cross- sectional only	None specified China	2012–2021 2014–2018	Δdolescents	 Psychological health: Depression Psychological health: Negative coping style Psychological health: Positive coping style Psychological health: Positive coping style Intervention: Education
Madigan	2020	Include: Observational Exclude: Qualitative	None specified	1973–2019	Children (0.5-10.6)	(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:
Мајог		Include: Randomised controlled trials	Low- or middle- income per World Bank	2007–2020	•	General (in background) • Intervention: Literacy (Abracadabra; in schools) • Cognition: Cognitive Functioning • Cognition: Executive
Mallawaarad	2022	Include: Cross- sectional or longitudinal	None specified	2014–2020	prior to school entry (1.4-5.4)	Functioning Developmental: General Developmental: Language or speech Psychological health: Psychosocial factors Psychological health: Self-regulation Sleep: General
Mares	2005		None specified Exclude: North	1969–1989	Children	Aggression: Towards peers Cognition: Reducing stereotypes Prosocial Behavior: Altruism Social interactions: General Cognition: Moral reasoning and perception of out-groups
Marker	2013	Exclude: Experimental None specified	America None specified	1973–2010 2001–15	None specified (6.0-12.2)	Learning: Physical and social environment Body composition • Video games: General • TV programs and movies:
Martins Martins	2019	Include: All quantitative designs Include: Cross-over or parallel randomized controlled trials	None specified None specified None specified	1985–2002 2003–2018 2006–2017	Adolescents • All	Physical activity: General Aggression: Towards peers Screen use: General TV programs and movies: Mealtime
Mazeas McArthur	2022	Include: Randomised controlled trials Include: Randomised controlled trials and quasi-RCTs. Include:	None specified None specified	2015–2019 1994–2009	(10.3-17.8)	 Physical activity: General Intervention: To promote physical activity (via gamification) Literacy: Phonics Intervention: Literacy (phonics; via computer)
McArthur Mei	2018	Include: Randomised controlled trials and quasi-RCTs. Include: cross- sectional, case- control, and cohort studies	Include: English speaking countries None specified	1994–2015 2004–2018	11-20 (13.5-16.8)	 Sleep: Problems Sleep: Time to fall asleep Screen use: General (excessive) Screen use: Virtual reality
Merchant	2014	Include: Experimental with control group	None specified	NA	•	simulations (Educational) Screen use: Virtual reality worlds (Educational) Video games: Virtual reality (Educational) Psychological health: Internalizing Risky behavior: Alcohol
Могі	2019	None specified	None specified	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
Neitzel Oldrati		Include: random assignment or quasi-experimental Include: Group-control experimental	Include: United States,Europe, Israel, Australia, and New Zealand	2004–2020	School-age Children	Literacy: Reading (technology supported) Cognition: Cognitive Functioning Cognition: Executive Functioning Cognition: Verbal skills Cognition: Visuospatial skills
Paik	1994	design None Include: All	None specified	NA	Children; Adolescents	
Pearce Peng	2016	Include: All quantitative designs None	None specified None specified	1986–2012 2001–2010	Adolescents Children; Adolescents	Internalizing content Cardiometabolic health: Maximum oxygen consumption Physical activity: Energy expenditure Physical activity: Heart rate content Video games: Physically active
Poorolajal Powers Prescott	2020	Include: Observational Include: Experimental or quasi-experimental designs Include: Longitudinal	None specified None specified None specified	1995–2018 1985–2012 2008–2017	None specified All	 Body composition Body composition Video games: General Video games: General Video games: General Aggression: Towards peers Video games: Violent content
Reynard Rodriguez-		None specified Include: Experimental;	None specified None specified None specified	2008–2017 2016–2020 1999–2018	(8.9-16.0) 8-14 years	Psychological health: Emotion experience Psychological health: Emotion regulation Psychological health: Emotion regulation Psychological health: Emotion intervention: To improve emotional regulation (via digital games) Piet: Fruit and vegetable intake Intervention: Fruit and
Rodriguez- Rocha Sadeghirad Scherer	2016	Quasi- experimental Include: Randomised controlled trials Include: Experimental or quasi-experimental designs	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 Advertising: Unhealthy food Learning: Programming skills Intervention: Education (programming)
Schroeder Scionti	2013	Include: Experimental; Quasi- experimental Include: Interventions	None specified None specifed	2001–2009	Children (4.3-6.1)	 Learning: General Cognition: Executive functioning Intervention: With digital characters Intervention: Cognitive training Intervention: To promote health (via mobile phone app)
Shin Slavin	2014	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 Intervention: To promote health (via mobile phone) Intervention: To promote health (via mobile phone) Intervention: To promote health (via text message) Science: General 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 Screen use: Video (vs face-to-face) Learning: General e-Books: Narration
Takacs	2019	Quasi- 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
Tekedere Tokac	2019	Include: desgins with a control group Include:	None specified None specified	2010–2015 2006–2016	All PreK-12th grade	Functioning (working memory) Learning: General Intervention: Augmented reality (in schools) Numeracy: Mathematics Video games: Educational
Vahedi Vannucci	2018	Include: Interventions (prepost or controlled). Exclude: Crosssectional Exclude: Qualitative; Case studies	None specified None specified	2015–2016	(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
Wang Wouters	2020	Include: longitudinal, cohort, case- control, cross- sectional, or controlled trials Include: experimental	None specified None specified	2016–2020 2005–2012	<=18 years (9.5-16.8)	
Wouters Wouters Xie	2013	designs Include: Experimental with control group Include: Experimental; Quasi- experimental; Pretest post-test	None specified None specified None specified	2005–2012 1993–2007 2010–2018	specified None specified Children	 Learning: Motivation Video games: Educational Video games: Educational (with instructional support) Learning: General Intervention: Education (via touch screen)
Xie Yin		test post-test Include: experimental, quasi- experimental, or pre-post test None specified	None specified None specified	2010–2018	(1.8-5.8)	 Learning: General Psychological health: General Psychological health: Positive mental health Screen use: Touchscreens Social Media: General
Zhang Zhang	2016	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 • TV programs and movies: General • Screen use: General
Zhang		Include: Observational or experimental designs Exclude: Non- empirical studies;	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 Video games: Health promoting
Zhou		Qualitative; Systematic reviews or meta-analyses Include: observational cross-sectional, case-control, or longitudinal	None specified None specified	2009–2018	All	 Healthy behavior: General Healthy behavior: Self-efficacy Psychological health: Enjoyment Psychological health: Depression Video games: Health promoting content Computer use: General Screen use: General Screen use: General (mobile phone) TV programs and movies: General
Zucker	2009	designs Include: Randomised controlled trials; Quasi- experimental; Observational	None specified	1997–2006	Children (Primary/Eleme	General • Video games: General • Literacy: Decoding • Literacy: Reading comprehension • e-Books: General
de Oliveira	2016 rided	Include: Observational	None specified	2010–2014	Adolescents	Cardiometabolic health: Metabolic Syndrome • Screen use: General