Review Characterists First Author	eteristics	cteristics and quality assessment Design Restrictions			Sample Age Restrictions (Age Range)	g unique effects Outcomes Assessed Exposures Assessed	
Abrami		Include: Experimental designs	None specified	2009–2019	Pre K to Grade •	Literacy: Listening comprehension Literacy: Phonics Literacy: Phonomic awareness Literacy: Reading comprehension Literacy: Reading fluency	ools)
Adelantado- Renau	2019	sectional studies	None specified	1982–2019	Children; • Adolescents • (5.7-18.0)	Literacy: Vocabulary knowledge Learning: General Literacy: General Numeracy: General Numeracy: General Video games: General	
Aghasi Andrade	2020	Include: Observational Include: Interventions	None specified None specified	2007–2016	(14.2-15.8) Children; Adolescents	Body composition • Internet use: General Healthy behavior: Self-efficacy Psychological health: Depression Psychological health: Enjoyment Self-perceptions: General • Video games: Physical	ılly active
Arztmann Aspiranti	2022	None specified Include:	None specified None specified	2008–2020 2013–2015	K - Grade 8 School-age	Self-perceptions: Self-esteem Learning: Behavior Learning: Motivation • Video games: Education competition) • Intervention: Education	·
Baradaran Mahdavi	2021	Interventions Include: Observational Exclude: Experimental	None specified	1999–2019	(Primary/Elemen None specified • (9.0-16.0)	 Screen use: General (et al.) Physical health: Lower back pain TV programs and mov General 	
Bartel	2015	None	None specified	2004–2014	Adolescents (12.2-17.7)	 Computer use: General Internet use: General Screen use: General (r phone) TV programs and mov General Video games: General 	mobile vies:
Beck Silva Benavides- Varela Blok		Include: Randomised controlled trials and quasi-RCTs. Include: Randomised controlled trials None	None specified None specified None specified	1999–2019 2006–2018 1990–2000	Children •	 Diet: Fat consumption Intervention: Nutrition schools) Numeracy: Mathematics Intervention: Mathematics Literacy: Reading fluency Intervention: Literacy 	
Bossen	2020	Include: Randomised controlled trials Include:	None specified	2011–2018	(5.4-11.5) Children (10.0-15.7) Children;	Body composition Cardiometabolic health: Fitness Video games: Health properties to content Physical activity: General content Physical health: Muscular fitness	-
Boyland Byun	2016	Experimental Include: All quantitative designs	None specified None specified	2004–2015	(6.0-10.4) School-age Children	 Diet: Food intake Advertising: Unhealthy Numeracy: General Video games: Numera Cognition: Executive functioning Cognition: Executive 	
Cao	2020	Include: designs with control groups Include: All quantitative	None specified None specified	2002–2019 2011–2015	(3.4-14.3)	Functioning (cognitive flexibility) Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working memory) Sleep: Inadequate duration Sleep: Lethargy • Computer use: Execut functioning training • Screen use: General (representation)	
		designs Include:			(10.6-17.0) • • • • • • • • • • • • • • • • • • •	Body composition Diet: Fat consumption Diet: Fruit and vegetable intake Diet: Fruit intake Diet: Sugary drinks and snacks	
Champion	2019	Randomised controlled trials	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 is behaviour (at school)	risk
Chan Chauhan	2014	Include: Experimental; Quasi-experimental Include: pre-post designs with or without control group	None specified None specified	2002–2012 2001–2016	Elementary	 Numeracy: General Intervention: Dynamic software Learning: General Screen use: General (in 	
Chen		Include: Experimental designs Include: Randomised controlled trials Include:	None specified None specified	2008–2019 1982–2010	School-age	 Video games: Education competition) Literacy: Reading schools) Intervention: Reading schools) 	(in
Cheung Cho	2013	Experimental; Quasi-experimental Include: experiemental designs with control group Include:	None specified None specified	1980–2010 2008–2013	Children None specified •	Numeracy: General schools) Learning: Second language Screen use: General (rephone for language learning) Psychological health: ADHD	mobile
Claussen	2022	Longitudinal; Retrospective Include: randomised experimental designs include: randomized and	None specified None specified	2004–2018 2011–2016	None specified • None specified •	Psychological health: ADHD Symptoms (Inattention) Literacy: Reading performance • Screen use: General • Screen use: General	(vs paper)
Comeras- Chueca	2021	non-randomized controlled trials (control group with no intervention or traditional exercise intervention) Include:	None specified	2008–2019	(4.5-11.6)	Body composition: BMI Cardiometabolic health: Fitness • Video games: Physical Body composition: BMI	ılly active
Comeras- Chueca	2021	randomized and non-randomized controlled with control group with no intervention or traditional exercise intervention	None specified	2010–2020	• • Under 18	Body composition: BMI z-score Body composition: Body fat percentage Body composition: Fat-free mass Body composition: Waist circumference	ally active
Coyne	2018	None Include: All quantitative designs; Experimental	None specified None specified	1975–2017 1989–2009	Adolescents Children; Adolescents	Prosocial Behavior: General • Screen use: Prosocial Healthy behavior: General • Intervention: Health be	ehaviours
Darling Eirich	2017	Include: Intervention Include: experimental or observational	None specified None specified	2006–2016 1978–2021	Adolescents (8.7-16.0) 12 or under	Diet: Healthy dietary behaviour Physical activity: General Psychological health: Externalizing Psychological health: Internalizing	ote nealth
Fang Feng		Include: Cohort; Case-control; Cross-sectional Include: Quantitative	None specified None specified	2006–2019 2017–2019	1 month - 4 99	 Body composition Computer use: General Screen use: General TV programs and mov General Body composition: BMI z-score Screen use: General (reguidelines) 	vies:
Ferguson	2017	designs None Include: Experimental,	None specified	2005–2017	years old Children; Adolescents None specified	Risky behavior: Sexual activity Risky behavior: Sexual activity (initiation of sex) guidelines) Screen use: Sexual co	ontent
Ferguson Folkvord Foreman	202020182021	Experimental, correlational, or longitudinal Include: Interventions Include: observational and intervention studies	None specified None specified None specified	2009–2013 2007–2018 2015–2020	(7.8-17.5) Children; Adolescents	Agression: General • Video games: Violent of the second o	nes
Furenes	2021	Include: experimental or quasi-experimental	None specified	2002–2019	1-8 years old	Literacy: Reading comprehension Literacy: Vocabulary learning tablet) • e-Books: General Learning: Educational	
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: Cyberbul victimization Intervention: Augmentation (in schools)	
Ghobadi Graham		Case-control; Cross-sectional Exclude: Interventions Include: Experimental; Quasi-experimental	None specified None specified	2009–2014	Children; Adolescents School-age Children (Primary/Elemen School)	 TV programs and mov Mealtime Literacy: Writing Intervention: Writing feet 	
Haghjoo Hammersley		Include: observational designs Include: Randomised controlled trials Include:	None specified None specified	2008–2021 2003–2013	10-20 years old Children; Adolescents	Body composition: Overweight/obesity • Screen use: General • Intervention: To promote weight (obesity prevention)	ntion)
Hao Hassan- Saleh He		Experimental with control group Include: Experimental; Quasi-experimental Include:	None specified None specified	2012–2018 2008–2016 2009–2018	college Children; Adolescents 6-18 years	Learning: Second language vocabulary Intervention: English as language Literacy: Pronunciation Intervention: Pronunciation Intervention: To promore physical activity: General physical activity (via more physical activity)	ation
Hernandez- Jimenez	2021	Randomised controlled trials Include: Experimental; Quasi-experimental	None specified None specified	2009–2018	(9.9-16.6) Children; Adolescents Early childhood/pre-	Physical activity: General physical activity (via mphone) Body composition • Video games: Physical	
Hurwitz Ivie		None Include: Correlational studies Include:	Include: North America None specified	1997–2018 2012–2019	Children (Early Primary/Element	Psychological health: Depression • Intervention: Literacy of the state of the stat	
Janssen Kates	2020	Experimental; Cross-sectional; Longitudial	None specified None specified	2007–2019	School-age Children	Sleep: Duration • Screen use: General Learning: General • Screen use: General (rephone)	mobile
Kim Kroesberger		Include: experimental or quasi-experimental Include: Within subject design; between subject design	None specified None specified	2010–2018 1985–1999	Grade 3 (3-9 years old) School-age Children (Primary/Elemen (7.0-11.3)	Learning: Literacy and numeracy Literacy: General Numeracy: General Intervention: Mathema computer in classroom	atics (via
Kucukalkan Lanca	2019	Include: Experimental Include: Cohort; Case-control; Cross-sectional; Intervention trials. Exclude: Case	None specified None specified	2007–2016	(Primary/Elemen	Numeracy: General • Intervention: Mathematical stress of the stress of	atics
Li Li		reports; Retrospective studies. Include: Experimental; Quasi-experimental None specified	None specified None specified	1991–2005 2005–2019	School-age Children Infants, toddlers, and preschoolers	Numeracy: General • Intervention: Mathema Body composition: Overweight/obesity • Screen use: General	atics
Li Li		None specified Include: Randomised controlled trials	None specified None specified	2005–2019	preschoolers (0-7 years) 3-18 years	Developmental: Gross motor (locomotor) Developmental: Gross motor (non-locomotor) Developmental: Gross motor Developmental: Gross motor	deo games
Li Liao		Include: experimental or quasi-experimental Include: All quantitative designs	None specified Include: Taiwan	2014–2021 1990–2003	None specified • School-age	 (object control skills) Learning: Computational thinking Computer use: Progra exercises Intervention: Education computer) 	
Liao Liu	2014	•	None specified None specified	1999–2012 2001–2014	(Primary/Elemen Children; Adolescents (4.0-14.7)	Body composition Intervention: Screenting reduction Psychological health: Depression Screen use: General	ne
Liu		•	None specified	2007–2014 NA	All (13.3-16.6)	Psychological health: Anxiety Psychological health: Depression Psychological health: Satisfaction Social Media: Instant r Video games: General	• •
Liu Liu Lu	2022	with control group Include: Observational Include: Cross-	None specified None specified China	NA 2012–2021 2014–2018	10-19 years Adolescents	Psychological health: Depression Psychological health: Depression Social Media: General Psychological health: Negative coping style Screen use: General (recogning style)	
Lu	2021	sectional only Include:	China	2014–2018	Adolescents	 coping style Psychological health: Positive coping style Intervention: Education Screen use: General Screen use: General TV programs and move 	n (general) coviewing)
Madigan	2020	Include: Observational Exclude: Qualitative Include:	None specified Low- or middle-	1973–2019	Children (0.5-10.6)	Coviewing • TV programs and mov Educational • TV programs and mov General • TV programs and mov General • TV programs and mov General (in background)	vies: vies: vies:
Major	2021	Randomised controlled trials Include: Cross-	income per World Bank	2007–2020	1-6 years &	Learning: General Intervention: Literacy (Abracadabra; in school (Abracadabra	
Mallawaarad	2022	Include: Cross- sectional or longitudinal	None specified	2014–2020	prior to school entry (1.4-5.4)	Psychological health: Psychosocial factors Psychological health: Self- regulation Sleep: General	eliaon
Mares	2005	None	None specified	1969–1989	Children •	Aggression: Towards peers Cognition: Reducing stereotypes Prosocial Behavior: Altruism Social interactions: General Cognition: Moral reasoning and perception of out-groups	vies:
Mares Marker	2013	Exclude: Experimental None specified	Exclude: North America None specified	1973–2010 2001–15	Children	Learning: General Learning: Literacy and numeracy Learning: Physical and social environment Body composition Intervention: Sesame S Video games: General	l
Marshall Martins	2019	None Include: All quantitative designs Include: Cross-over or parallel	None specified None specified	1985–2002 2003–2018	Adolescents • All	 TV programs and mov General Video games: General Aggression: Towards peers TV programs and mov General Video games: General 	l
Martins Mazeas	2022	or parallel randomized controlled trials Include: Randomised controlled trials	None specified None specified	2006–2017 2015–2019	None specified	Diet: Food intake (calories)	
McArthur McArthur	2012	Include: Randomised controlled trials and quasi-RCTs. Include: Randomised controlled trials and quasi-RCTs.	None specified Include: English speaking countries	1994–2009 1994–2015	(6.7-16.2)	Literacy: Phonics • Intervention: Literacy (via computer) Literacy: General • Intervention: Literacy	(phonics;
Mei Merchant	2018	Include: cross-sectional, case-control, and cohort studies Include: Experimental with	None specified None specified	2004–2018 NA	11-20 (13.5-16.8) • K-12	Sleep: Duration Sleep: Problems Sleep: Time to fall asleep Screen use: General (e.g.) Screen use: Virtual reasimulations (Education Screen use: Virtual reasimulations (Education (Educational))	ality nal)
,√ıerchant	_014		Sine specified	. 4/7		 Screen use: Virtual real (Educational) Video games: Virtual real (Educational) Psychological health: Internalizing Risky behavior: Alcohol consumption 	-
Mori	2019	None specified	None specified	2013–2018	<18 years (12.3-16.7) •	•	
Neitzel	2022	Include: random assignment or quasi-experimental Include: Group-	Include: United States,Europe, Israel, Australia, and New Zealand	2004–2020	Kindergarten- Grade 6	Literacy: Reading Intervention: Reading (technology supported) Cognition: Cognitive Functioning Cognition: Executive	
Oldrati Paik	2020	Include: Group- control experimental design	None specified None specified	2006–2018 NA	School-age Children Children;	Functioning Cognition: Verbal skills Cognition: Visuospatial skills Numeracy: General Psychological health: Adjustment • TV programs and mov	-
Pearce	2016	Include: All quantitative designs	None specified	1986–2012	Adolescents Children; Adolescents Children:	Psychological health: Internalizing • TV programs and mov content Cardiometabolic health: Maximum oxygen consumption	vies: Scary
Peng Poorolajal	2011	None Include: Observational	None specified None specified	2001–2010 1995–2018	Adolescents • Children:	Maximum oxygen consumption Physical activity: Energy expenditure Physical activity: Heart rate TV programs and mov General Video games: General	vies:
Powers Prescott	2013	Include: Experimental or quasi-experimental designs Include: Longitudinal	None specified None specified	1985–2012 2008–2017	None specified All (8.9-16.0)	Cognition: Information processing • Video games: General • Video games: Violent of the control	l content
Reynard Rodriguez- Rocha		None specified Include: Experimental; Quasi-experimental	None specified None specified	2016–2020 1999–2018	8-14 years •	Psychological health: Emotion experience Psychological health: Emotion regulation Psychological health: Emotion emotional regulation: Intervention: To improve emotional regulation (vigames) Diet: Fruit and vegetable intake Intervention: Fruit and	ve via digital
Rocha		Quasi-experimental Include: Randomised controlled trials Include: Experimental or quasi-experimental designs	None specified None specified	1978–2014 1973–2017	(4.5-15.4) Children; Adolescents (3.8-11.0)	Diet: Unhealthy food choice • Advertising: Unhealthy Learning: Programming skills • Intervention: Fruit and	y food
Schroeder Scionti	2013 2019	Include: Experimental; Quasi-experimental Include: Interventions	None specified None specified	2001–2009 2009–2019	Children (4.3-6.1)	 Learning: General Intervention: With digit characters Cognition: Executive functioning Intervention: Cognitive Intervention: To promote this making phase and the phase and the	e training ote health
Shin	2019	Include: Interventions Include: Randomised controlled trials;	None specified	2013–2018	Adolescents (12.0-15.7) School-age	Body composition Diet: Sugary drinks Physical activity: General Screen time: General Screen time: General Intervention: To promotive (via mobile phone) Intervention: To promotive (via text message)	ote health ote health
Slavin	2014	Quasi- experimental; Observational Include: experimental and quasi-experimental designs	None specified None specified	2000–2011 1994–2019	Children (Primary/Elemen Average 6 years, all must	 Science: General Intervention: Science (schools) Screen use: Video (vs. face) 	
Takacs Takacs	2014	Include: Experimental; Quasi-experimental Include: Randomised	None specified None specified	1980–2014 2001–2016	NA • Children	Learning: General • e-Books: Narration Cognition: Executive Functioning (accuracy) Cognition: Executive Functioning (cognitive flexibility) Intervention: Education Cognition: Executive	n (via
Takacs Tekedere	2019	controlled trials and quasi-RCTs.	None specified None specified	2001–2016	•	Functioning (cognitive flexibility) Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working memory) Learning: General Intervention: Education computer) Intervention: Augmentation computer Intervention: Augmentation computer Intervention: Augmentation computer Intervention: Augmentation computer Intervention: Education computer Intervent	
Tokac Vahedi		Include: desgins with a control group Include: Interventions (prepost or controlled). Exclude: Crosssectional	None specified None specified	2006–2016 2015–2016	School-age	Numeracy: Mathematics • Video games: Education Risky behavior: Media literacy Risky behavior: Risk taking (attitude) • Intervention: Media literacy (web-based)	
Vannucci	2020	Exclude: Qualitative; Case studies	None specified	2011–2018	Adolescents (12.6-18.0)	Risky behavior: Risk taking (general) Risky behavior: Risky sexual behaviour Risky behavior: Substance abuse Social Media: General	
Wang	2020	Include: longitudinal, cohort, case- control, cross- sectional, or controlled trials Include: experimental designs	None specified None specified	2016–2020 2005–2012	<=18 years (9.5-16.8) •	 Eye health: Visual impairment	
Wouters		experimental designs Include: Experimental with control group Include: Experimental; Quasi- experimental; Pre-	None specified None specified None specified	2005–2012 1993–2007 2010–2018	None specified •	Learning: Motivation • Video games: Education • Video games: Education instructional support) Learning: General • Intervention: Education touch screen)	onal (with
Wouters Wouters Xie	2018	experimental; Pretest post-test Include: experimental, quasi- experimental, or	None specified	2010–2018	(1.8-5.9) 0-5 (1.8-5.8)	Learning: General • Screen use: Touchscreen Psychological health: General	
Wouters Xie	2018	pre-post test			None specified •		
Wouters	2018	None specified Include: Cohort; Case-control; Cross-sectional Include:	None specified None specified	2006–2016 2001–2014		Body composition • TV programs and mov General	
Wouters Xie Yin	2018 2019 2016	None specified Include: Cohort; Case-control; Cross-sectional	None specified None specified Mainland China, Hong Kong, Macau	2001–2014	2-19 years (3.8-17.1) • 6-18 years (or	Body composition Psychological health: Other mental health problems Screen use: General Body composition Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Screen use: General	
Wouters Xie Xie Yin Zhang Zhang	2018 2019 2016 2022	None specified Include: Cohort; Case-control; Cross-sectional Include: Iongitudinal or cohort designs Include: Observational or experimental designs Exclude: Non- empirical studies; Qualitative; Systematic reviews	None specified None specified Mainland China,	2001–2014	2-19 years (3.8-17.1) 6-18 years (or grade 1-12) All	Body composition Psychological health: Other mental health problems Body composition Cardiometabolic health: Poor fitness Cardiometabolic health: Risks	vies:
Wouters Xie Xie Yin Zhang Zhang Zhang	2018 2019 2016 2022	Include: Cohort; Case-control; Cross-sectional Include: Iongitudinal or cohort designs Include: Observational or experimental designs Exclude: Non- empirical studies; Qualitative;	None specified None specified Mainland China, Hong Kong, Macau and Taiwan	2001–2014 2001–2021 2009–2020	2-19 years (3.8-17.1) 6-18 years (or grade 1-12) All	Body composition Psychological health: Other mental health problems Body composition Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Eye health: Myopia Physical health: Health Issues Psychological health: Emotion problems Healthy behavior: General Healthy behavior: Self-efficacy Psychological health: Enjoyment Psychological health: Enjoyment Computer use: General Screen use: General Screen use: General Screen use: General Screen use: General Typhone) Typrograms and move General	vies: promoting al mobile vies:
Wouters Xie Xie Yin Zhang Zhang Zhang	2018 2019 2016 2022 2022	Include: Cohort; Case-control; Cross-sectional Include: Iongitudinal or cohort designs Include: Observational or experimental designs Exclude: Non- empirical studies; Qualitative; Systematic reviews or meta-analyses Include: observational cross-sectional, case-control, or longitudinal	None specified None specified Mainland China, Hong Kong, Macau and Taiwan None specified	2001–2014 2001–2021 2009–2020 2009–2018	2-19 years (3.8-17.1) 6-18 years (or grade 1-12) All <20 years (11.5-17.9) School-age	Body composition Psychological health: Other mental health problems Body composition Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Eye health: Myopia Physical health: Health Issues Psychological health: Emotion problems Healthy behavior: General Healthy behavior: Self-efficacy Psychological health: Enjoyment Psychological health: Depression TV programs and move General Screen use: General Video games: Health problems Computer use: General Screen use: General Screen use: General Screen use: General Ty programs and move General (rephone) TV programs and move General (rephone) TV programs and move General	vies: promoting al mobile vies: