	acteristic	cteristics cs and quality assess Design Restrictions	•		unique effects		ristics for studies providing Outcomes Assessed			Elig. Crit. ³						Hetero
		Restrictions Include:	-			•	Literacy: Listening comprehension Literacy: Phonics Literacy: Phonomic awareness Literacy: Reading comprehension	•				Dual h Screen		Listed ⁷		L
Adelantado- Renau Aghasi	2019	Include:	None specified None specified	1982– 2019 2007– 2016	Children; Adolescents (5.7-18.0) All (14.2-15.8)	•	knowledge Learning: General Literacy: General Numeracy: General Body composition Healthy behavior: Self-	•	Screen use: General TV programs and movies: General Video games: General Internet use: General	U	L	L	L	L	L	L
Andrade	2019	Include: Interventions	Include: Overweight/obese	2010– e 2017	Children; Adolescents School-age Children	•	efficacy Psychological health: Depression Psychological health: Enjoyment Self-perceptions: General Self-perceptions: Self-esteem		Video games: Physically active	U	L	L	U	L	Н	L
Arztmann Aspiranti Baradaran	2020	Include: Interventions Include: Observational	None specified Include: Autism spectrum disorder Exclude: Medical conditions that	2008– 2020 2013– 2015		•	Learning: Benavior Learning: Motivation Learning: General Physical health: Lower	•	Video games: Educational (with competition) Intervention: Education (via touch screen) Screen use: General (excluding TV)	U	H	H	Н	H	Н	L
Baradaran Mahdavi Bartel	2021	Observational Exclude: Experimental		1999– 2019 2004– 2014	All (9.0-16.0) Adolescents (12.2-17.7)	•	Physical health: Lower back pain Sleep: Bedtime Sleep: Duration Sleep: Time to fall asleep	•		U	H	U	U	L	U	U
Beck Silva Benavides- Varela	2022	Include: Randomised controlled trials and quasi-RCTs. Include: Randomised controlled trials	or insomnia) Exclude: Any disease Mental disorders Include: Math difficulties Include: Regular students, poor	1999– 2019 2006– 2018	Adolescents	•	Diet: Fat consumption Numeracy: Mathematics	•		L U	L H	L L	L H	L L	H L	L
Blok		None Include:	students, poor readers or dyslexics Exclude: Severe or multiple disabilities Include: Chronic disease	1990– 2000 2011– 2018	All (5.4-11.5) Children (10.0-15.7)	•	Body composition Cardiometabolic health: Fitness Physical activity: General Physical health:		Video games: Health promoting content	U	L	H	H	L	Н	L
Boyland Byun	2016	Include: Experimental Include: All	None specified None specified	2004– 2015 2006– 2014	Children; Adolescents (6.0-10.4) School-age Children	•	Physical health: Muscular fitness Diet: Food intake Numeracy: General Cognition: Executive		Advertising: Unhealthy food Video games: Numeracy	H U	U	L U	U	L H	L	L H
Cao	2020	Include: designs with control groups	Exclude: Brain damage	2002– 2019	Children (3.4-14.3)	•	functioning Cognition: Executive Functioning (cognitive flexibility) Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working memory)		Computer use: Executive functioning training	U	Н	U	Н	L	L	L
Carter	2016	OHADIHATIVE	Include: Healthy populations only	2011– 2015	Children; Adolescents (10.6-17.0)	•	Body composition Diet: Fat consumption Diet: Fruit and vegetable intake Diet: Sugary drinks and		Screen use: General (mobile phone at bed time)	L	L	U	L	L	Н	L
Champion	2019	Include: Randomised controlled trials	None specified	2003– 2017	School-age 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	•	Intervention: Lifestyle risk behaviour (at school)	L	L	L	L	L	L	L
Chan Chauhan Chen	2017	Include: Experimental; Quasi- experimental Include: pre- post designs with or without control group Include: Experimental	None specified None specified	2002– 2012 2001– 2016	School-age Children School-age Children (Primary, Elementary)	•	Screen time: General Numeracy: General Learning: General	•	Intervention: Dynamic geometry software Screen use: General (in schools) Video games: Educational (with	U	H L	H U	Н	L H	L	L
Cheung	2020	Experimental designs Include:	None specified None specified	2008– 2019 1982– 2010 1980– 2010	All School-age Children School-age Children	•	Learning: General Literacy: Reading	•	Video games: Educational (with competition) Intervention: Reading (in schools) Intervention: Mathematics (in schools)	U	H L H	L H	H H U	H H L	H L	L
Cho	2018	experimental Include: experiemental designs with control group Include: Longitudinal; Retrospective	None specified None specified	2008– 2013 2004– 2018	All	•	language Psychological health: ADHD		Screen use: General (mobile phone for language learning) Screen use: General	U	H	U	Н	L	L	L
Clinton Comeras- Chueca	2019	experimental designs include: randomized and non-randomized controlled trials (control group with no intervention or traditional	Exclude: Disabilities Exclude: Disabilities, diseases or disorders, overweight or obese	2011– 2016 2008– 2019	All (4.5-11.6)	•	Literacy: Reading performance Body composition:		Screen use: Reading (vs paper) Video games: Physically active	U	L	U	L	L	L	L
Comeras- Chueca	2021	intervention or traditional exercise intervention) Include: randomized and non-randomized controlled with control group with no intervention or traditional exercise	overweight or obese Include: Overweight and obesity only Exclude: Participants with disabilities, diseases or disorders other	2019 2010– 2020	All (8.0-14.0)	•	Body composition: BMI Body composition: BMI z-score Body composition: Body fat percentage Body composition: Fat-free mass Body composition:	•	Video games: Physically active	L	L	L	U	L	Н	L
Coyne	2018	traditional exercise intervention	diseases or	1975– 2017 1989– 2009	Children; Adolescents Children; Adolescents	•	Fat-free mass Body composition: Waist circumference Prosocial Behavior: General Healthy behavior: General		Screen use: Prosocial content Intervention: Health behaviours	L	L	L	Н	L	L	L
Darling de Oliveira	2016	Include: Intervention Include: Observational	None specified Include: Healthy populations only	2006– 2016 2010– 2014	Children; Adolescents (8.7-16.0)	•	Body composition Diet: Healthy dietary behaviour Physical activity: General Cardiometabolic health: Metabolic Syndrome		Intervention: To promote health (via mobile phone) Screen use: General	U	L	U	U	L	H	H
Eirich	2022	experimental or	Exclude: Non-typically developing children None specified	1978– 2021 2006– 2019	Children (0.5-11.0) Children; Adolescents	•	Psychological health: Externalizing Psychological health: Internalizing Body composition	•	Screen use: General Computer use: General Screen use: General TV programs and movies: General	U	L	L	L	L	L	L
Ferguson Ferguson	2021	Quantitative designs None Include: Experimental,	Include: Healthy children None specified None specified	2017– 2019 2005– 2017	childhood; Pre-school Children; Adolescents	•	Risky behavior: Sexual activity Risky behavior: Sexual activity (initiation of sex)	•	Screen use: General (meeting guidelines) Screen use: Sexual content Video games: Violent	L	L	L	L H	L	H	L
Ferguson Folkvord Foreman	2020	Evperimental	None specified None specified None specified	2009– 2013 2007– 2018 2015– 2020	All (7.8-17.5) Children; Adolescents All	•	Diet: Food intake (calories)	•	Video games: Violent content Advertising: Advergames Screen use: General Screen use: General (phone or tablet)	U	U L	L L	U	L L	L H	L
Furenes	2021	Include: experimental or quasi-experimental	Exclude: Cochlear implants or autism Autism	2002– 2019 2006– 2014		•	Literacy: Reading comprehension Literacy: Vocabulary learning Learning: Educational achievement problems Learning: School	•	e-Books: General Internet use: Cyberbullying victimization	H	H	L	U	L	L	L
Gardella Garzón Ghobadi	2019		None specified None specified None specified			•	achievement problems Learning: School attendance problems Learning: General	•	Cyberbullying	U	H	L U	U H U	H L	L	L
Ghobadi Graham Haghjoo	2015	Exclude: Interventions Include: Experimental; Quasi- experimental Include: observational designs	None specified None specified Exclude: Those			•	Literacy: Writing	•		U	L	H	H	L	L	L
Hammersley Hao	2016	Include: Randomised controlled trials Include: Experimental with control group Include:	·	2003– 2013 2012– 2018	Children; Adolescents School-age Children	•	Body composition Learning: Second language vocabulary	•	Intervention: To promote healthy weight (obesity prevention) Intervention: English as foreign language	L	L	H	L	L	Н	L
Hassan- Saleh He Hernandez- Jimenez	2021	group Include: Experimental; Quasi- experimental Include: Randomised controlled trials Include:	None specified None specified	2008– 2016 2009– 2018 2009– 2017	Children; Adolescents Children; Adolescents (9.9-16.6) Children; Adolescents	•	Literacy: Pronunciation Physical activity: General	•	Intervention: Pronunciation Intervention: To promote physical activity (via mobile phone) Video games: Physically active	U	L	U L	U L	H L	H L	L
Hurwitz	2018	Experimental; Quasi- experimental None Include:	None specified	2017 1997– 2018	Early childhood; Pre-school; School-age Children (Early Primary, Elementary)	•	Literacy: General Psychological health:	•	Physically active Intervention: Literacy videos	L	L	Н	H	L	L	L
Ivie Janssen Kates		Correlational studies Include: Experimental; Cross-sectional; Longitudial None	None specified Include: Healthy children None specified	2012– 2019 2007– 2019 2008– 2016	Adolescents (14.0-18.0) Children School-age Children School-age	•	Depression Sleep: Duration Learning: General	•	Social Media: General Screen use: General Screen use: General (mobile phone)	U	L L	L L	L	L L	L U	L L
Kim Kroesberge	2021	experimental Include: Within subject design; between subject design	None specified Include: Students with math difficulties Include:	2010– 2018 1985– 1999	School-age Children (Early Primary, Elementary) School-age Children (Primary, Elementary) (7.0-11.3) School-age	•	Literacy: General Numeracy: General Numeracy: General	•	Screen use: Educational apps Intervention: Mathematics (via computer in classrooms)	U	L	U	L	L	L	L
Kucukalkan Lanca	2019	Include: Experimental Include: Cohort; Case-control; Cross-sectional; Intervention trials. Exclude: Case reports; Retrospective studies.	Include: Students with dyscalculia	2007– 2016 2007– 2016	(7.0-11.3)		Numeracy: General	•	Intervention: Mathematics Screen use: General	U	L	Н	U	H	L	L
Li Li	2010	Retrospective studies. Include: Experimental; Quasi- experimental None specified	None specified None specified Include: Non-	1991– 2005 2005– 2019	School-age Children Early childhood; Pre-school	•	Body composition: Overweight/obesity Sleep: Duration Developmental: Gross motor (locomotor)	•	Intervention: Mathematics Screen use: General	U	Н	U	U	L	H	L
Li	2022	Include: Randomised controlled trials Include: experimental or quasi- experimental	Include: Non- typically developing children	2012– 2020 2014– 2021	Children; Adolescents All School-age	•	motor (locomotor) Developmental: Gross motor (non-locomotor) Developmental: Gross motor (object control skills)	•	Intervention: Active video games for motor skills Computer use: Programming exercises	U	Н	L	Н	L	H	L
Liao Liao Liu	2014	experimental Include: All	None specified None specified None specified	1990– 2003 1999– 2012 2001– 2014	School-age Children (Primary, Elementary) Children; Adolescents (4.0-14.7) All (10.9-18.0)	•	Learning: General Body composition	•		L U	H L	H H L	L	H L	H L	H L
Liu Liu	2019	control; Longitudinal Include: All	None specified None specified			•	Psychological health: Anxiety Psychological health: Depression Psychological health: Satisfaction	•	Screen use: General Social Media: Instant messaging Video games: General Screen use: General	U	L	U	H H	L	L	L
Liu Liu Lu	2022	group Include: Observational Include: Cross-	None specified None specified Include: Healthy only	NA 2012- 2021 2014- 2018	Adolescents Adolescents	•	Psychological health: Depression Psychological health: Negative coping style Psychological health: Positive coping style	•	Social Media: General (duration) Screen use: General (mobile phone addiction) Intervention: Education	U	L	H L U	H U	L	L	L
Madigan	2020	Include: Observational Exclude: Qualitative	Exclude: Asd or intellectual disability	1973– 2019	Children (0.5-10.6)	•	Literacy: General	•	(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	U	L	L	U	L	L	L
Major	2021	Include: Randomised controlled trials	None specified	2007– 2020	Children; Adolescents	•	Learning: General Cognition: Cognitive Functioning Cognition: Executive Functioning	•	TV programs and	U	L	L	Н	L	L	L
Mallawaarad	2022	Include: Cross- sectional or longitudinal	Include: Non- clinical	2014– 2020	Early childhood; Pre-school (1.4-5.4)	•	Cognition: Executive Functioning Developmental: General Developmental: Language or speech Psychological health: Psychosocial factors Psychological health: Self-regulation Sleep: General Aggression: Towards	•	Screen use: General (mobile phone or tablet)	L	L	L	L	L	L	L
Mares	2005	None	None specified	1969– 1989	Children	•	peers Cognition: Reducing stereotypes Prosocial Behavior: Altruism Social interactions: General Cognition: Moral reasoning and perception of out-	•	TV programs and movies: General	U	L	Н	Н	L	Н	Н
Mares Marker	2022	None specified	None specified None specified	1973– 2010 2001–15 1985–	Children All (6.0-12.2) Children;	•	reasoning and perception of outgroups Learning: General Learning: Literacy and numeracy Learning: Physical and social environment Body composition	•	Intervention: Sesame Street Video games: General TV programs and	U	H L	н	H L	L	H L	L
Marshall Martins Martins	2019	Include: All quantitative designs Include: Crossover or parallel randomized controlled trials	None specified None specified None specified	1985– 2002 2003– 2018 2006– 2017	Children; Adolescents All Children; Adolescents	•	Physical activity: General Aggression: Towards peers	•	TV programs and movies: General Video games: General Screen use: General TV programs and movies: Mealtime	U	L	H U	H H	H L	H L	L L
Martins Mazeas McArthur	2022	randomized controlled trials Include: Randomised controlled trials Include: Randomised controlled trials and quasi-RCTs.	None specified Exclude: Contraindictions to physical activity Intellectual and cognative impairments Include: Poor readers			•	(calories) Physical activity: General	•		L	L	L	L	L	L	L
McArthur Mei	2018	and quasi-RCTs. Include: Randomised	readers Include: Poor readers None specified	2009 1994– 2015 2004– 2018	(6.7-16.2) Children; Adolescents Adolescents (13.5-16.8)	•	Literacy: General Sleep: Duration Sleep: Problems Sleep: Time to fall asleep	•	Intervention: Literacy Screen use: General (excessive) Screen use: Virtual	L	Н	L	L	L	Н	L
Merchant	2014	Include: Experimental with control group	None specified	NA	School-age Children	•	Learning: General Psychological health: Internalizing Risky behavior: Alcohol	•	reality simulations (Educational)	U	L	Н	Н	Н	Н	L
Mori	2019	None specified	None specified	2013– 2018	All (12.3-16.7)	•	Internalizing Risky behavior: Alcohol consumption Risky behavior: Delinquency Risky behavior: Drug use Risky behavior: Sexual activity Risky behavior: Sexual activity (contraception use)		Screen use: Sexting	U	Н	L	U	L	L	L
Neitzel	2022	Include: random assignment or quasi- experimental	Include: Struggling readers Include: Both	2004– 2020	School-age Children (Primary, Elementary)	•	use) Risky behavior: Sexual activity (multiple partners) Risky behavior: Smoking Literacy: Reading Cognition: Cognitive Functioning	•	Intervention: Reading (technology supported)	U	L	Н	Н	L	Н	Н
Oldrati Paik	2020	control experimental design	Include: Both typically developing and atypically developing with neurodevelopmen disorder None specified	2006– 2018 T	School-age Children Children; Adolescents	•	Functioning Cognition: Executive Functioning Cognition: Verbal skills Cognition: Visuospatial skills Numeracy: General Psychological health: Adjustment	•	Intervention: Cognitive training TV programs and movies: Violent content	U	Н	U	Н	L	L	L
Paik Pearce Peng		Include: All quantitative designs	None specified None specified Include: Healthy populations only	NA 1986– 2012 2001– 2010	·	•	Psychological health: Internalizing Cardiometabolic health: Maximum oxygen consumption Physical activity: Energy expenditure	•		U	H	U H U	H U	H H	L	H
Peng Poorolajal Powers	2020	Include: Observational Include: Experimental or quasi- experimental	•			•	Physical activity: Energy expenditure Physical activity: Heart rate Body composition	•	_	U	L	U L U	U	L	L	L
Powers Prescott Reynard	2013	Experimental or quasi- experimental designs Include: Longitudinal	None specified None specified Exclude: Neurological disorder		All (8.9-16.0) Children; Adolescents	•	Aggression: Towards peers Psychological health:	•	Video games: Violent content Intervention: To improve emotional regulation Intervention: To improve emotional	U	L	U	H H	L	L	L
Rodriguez- Rocha	2019	Include: Experimental; Quasi- experimental Include: Randomised controlled trials Include:	Neurological disorder None specified None specified		·	•	Psychological health: Emotion regulation Diet: Fruit and vegetable intake	•	Intervention: To	H U	L	L	L	L	L	L
Scherer Schroeder Scionti	2020	controlled trials Include:	Exclude: Clinical or special needs populations None specified None specified	2014 1973– 2017 2001– 2009– 2019		•	Learning: Programming skills Learning: General	•	Intervention: Education (programming) Intervention: With digital characters Intervention: Cognitive training	U	H	U	H H	L L	L	L L
Scionti		Interventions Include:	None specified Include: No health conditions except obesity			•	Body composition Diet: Sugary drinks Physical activity: General	•		U	L	L	L	L	H	L
Slavin	2014	and quasi-	None specified Include: No developmental	2000– 2011 1994– 2019	School-age Children (Primary, Elementary) Early childhood; Pre-school; School-age Children		Science: General	•	Intervention: Science (in schools) Screen use: Video (vs	U	Н	Н	Н	L	H	H
Strouse	2014	experimental and quasi-		1994– 2019 1980– 2014	School-age	•	Learning: General Learning: General Cognition: Executive Functioning (accuracy)	•	Screen use: Video (vs face-to-face) e-Books: Narration	Н	L	U	Н	H	L	L
Takacs Tekedere	2019	and quasi-RCTs.	None specified None specified	2001– 2016 2010– 2015	Children	•	Functioning (accuracy) Cognition: Executive Functioning (cognitive flexibility) Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working memory)	•	Intervention: Education (via computer) Intervention: Augmented reality (in	L	L	U	H	L	L	L
Tekedere Tokac Vahedi	2019	Include: desgins with a control group Include: Interventions (pre-post or controlled). Exclude: Cross-	None specified None specified		All School-age Children School-age Children (Middle/High School)	•	Learning: General Numeracy: Mathematics Risky behavior: Media	•		U	H H	U	U H U	L	L	L
Vannucci	2020	controlled). Exclude: Cross- sectional Exclude: Qualitative; Case studies Include: longitudinal, cohort, case-	None specified	2016 2011– 2018 2016–	(Middle/High School) Adolescents (12.6-18.0)	•	Risky behavior: Risk taking (attitude) Risky behavior: Risk taking (general) Risky behavior: Risky sexual behaviour Risky behavior: Substance abuse	•	Social Media: General Screen use: General	U	L	U	Н	L	L	L
Wang Wouters	2013	longitudinal, cohort, case-control, cross-sectional, or controlled trials Include: experimental designs Include: Experimental with control	None specified Exclude: Disabilities None specified	2016– 2020 2005– 2012 1993– 2007	AII (9.5-16.8) AII	•	impairment Learning: Motivation	•	Screen use: General (mobile phone) Video games: Educational Video games: Educational (with instructional support)	U	L L	L U	L H	L	L	L
Wouters Xie	2013	Experimental with control group Include: Experimental; Quasi- experimental; Pre-test post- test Include: experimental, quasi- experimental, quasi- experimental, or	None specified None specified Exclude: Health conditions		Children (1.8-5.9) Early childhood; Pre-school	•	Learning: General Learning: General	•	Educational (with	U	L	U L U	н	L	L	L
Xie Yin Zhang	2019	quasi- experimental, or pre-post test None specified Include: Cohort; Case-control; Cross-sectional			Pre-school (1.8-5.8) All Children	•	Psychological health: General Psychological health: Psychological health: Positive mental health Body composition	•		U	H	U	H H	L	L	L
Zhang Zhang	2022	Include: longitudinal or cohort designs Include: Observational or experimental	Exclude: Chronic conditions Exclude: Psychological or physical		Children; Adolescents (3.8-17.1) Children; Adolescents		Psychological health: Other mental health problems Body composition Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Eye health: Myopia	•		U	L	L	U	L	L	L
Zhang	2022	Observational or experimental designs Exclude: Non-empirical studies; Qualitative; Systematic reviews or meta-	Psychological or		•	•	health: Risks			U	L	U	Н	L	L	L
Zou	2021	Systematic reviews or meta-analyses Include: observational cross-sectional, case-control, or longitudinal designs Include:	None specified	2018 2009– 2021	AII (11.5-17.9)	•	Psychological health: Enjoyment Psychological health: Depression	•	Computer use: General Screen use: General Screen use: General (mobile phone) TV programs and movies: General Video games: General	U	L	U	U	L	L	L
 Where prov Eligibility cri Literature se Dual independent 	2009 com the l rided riteria pre earch st endent s	Include: Randomised controlled trials; Quasi- experimental; Observational National Health, Lung edefined and specifie trategy comprehensiv	ed	1997– 2006 's Quality Asse	School-age Children (Primary, Elementary)	•	Literacy: Decoding Literacy: Reading comprehension	•	e-Books: General es tool. Note that we excluded	L d the firs	L t item of	U the tool.	Н	L	Н	L
⁵ Dual indepe	endent s endent c udies lis	screening & review quality assessment ted with important chasessed	·	sults of each						_						