	acteristic	cteristics es and quality assess Design Restrictions	Regions Restrictions				stics for studies providing	unique effects Exposures Assessed	Elig. Crit. ³	Lit.	Dual	ty Assess Dual 1 Qual.6	sment ¹ Studies		Hetero
Abrami		Include: Experimental designs	None specified	2009–2019	Pre K to Grade	•	Literacy: Listening comprehension Literacy: Phonics Literacy: Phonomic	Intervention: Literacy (Abracadabra; in schools)	L	U	L	Н	L	L	L
Adelantado- Renau Aghasi	2019	Include: Cross- sectional studies	None specified	1982–2019 2007–2016	Children; Adolescents (5.7-18.0)	•	Learning: General Literacy: General Numeracy: General	Screen use: General TV programs and movies: General Video games: General	L	L	Ĺ L	L	L	L	L
Andrade	2019	Observational Include: Interventions	None specified	2010–2017	(14.2-15.8) Children; Adolescents	•	Healthy behavior: Self- efficacy Psychological health: Depression Psychological health: Enjoyment Self-perceptions: General	Video games: Physically active	U	L	L	U	L	Н	L
Arztmann Aspiranti	2022	None specified Include: Interventions	None specified None specified	2008–2020	K - Grade 8 School-age Children	•	Learning: Motivation	Video games: Educational (with competition) Intervention: Education (via touch screen)	U	H	H	н	H	L	L
Baradaran Mahdavi	2021	Include: Observational Exclude: Experimental	None specified	1999–2019	(Primary/Element	•	Physical health: Lower back pain Sleep: Bedtime	Screen use: General (excluding TV) TV programs and movies: General Computer use: General Internet use: General Screen use: General	U	Н	L	L	L	L	L
Bartel Beck Silva	2015	Include: Randomised controlled trials and quasi-RCTs.	None specified None specified	2004–2014	Adolescents (12.2-17.7) 10 - 19 years	•	Sleep: Duration Sleep: Time to fall asleep	(mobile phone) TV programs and movies: General Video games: General Intervention: Nutrition (in schools)	L	L	L	L	L	Н	L
Benavides- Varela Blok	2020	Include: Randomised controlled trials None Include:	None specified None specified	2006–2018	Children All (5.4-11.5)	•	Mathematics	Intervention: Mathematics Intervention: Literacy	U	H L	Н	Н	L	H	L
Bossen	2020	Randomised controlled trials Include: Experimental Include: All	None specified None specified	2011–2018	Children (10.0-15.7) Children; Adolescents (6.0-10.4)	•	Physical activity: General Physical health: Muscular fitness Diet: Food intake	Video games: Health promoting content Advertising: Unhealthy food	Н	L	L	U	L	H L	L
Byun		uantitative designs Include: designs with control groups	None specified None specified	2006–2014	School-age Children 3-12 years (3.4-14.3)	•	Cognition: Executive functioning Cognition: Executive Executive	Video games: Numeracy Computer use: Executive functioning training	U	Н	U	н	H	H	H
Carter	2016	Include: All quantitative designs	None specified	2011–2015	Children; Adolescents (10.6-17.0)	•	Cognition: Executive Functioning (working memory)	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)	•	Body composition Diet: Fat consumption Diet: Fruit and vegetable intake Diet: Fruit intake Diet: Sugary drinks and snacks Physical activity: General Physical activity:	Intervention: Lifestyle risk behaviour (at school)	L	L	L	L	L	L	L
Chan	2014	Include: Experimental;	None	2002–2012	School-age	•	Moderate-to-vigorous intensity Risky behavior: Alcohol consumption Risky behavior: Smoking Screen time: General	Intervention: Dynamic	U	Н	Н	Н	L	L	L
Chauhan Chen	2017	Quasi- experimental Include: pre- post designs with or without control group Include: Experimental designs	None specified None specified	2001–2016	Children Elementary school students None specified	•	Learning: General	geometry software Screen use: General (in schools) Video games: Educational (with competition)	U	L	U	Н	Н	L	L
Cheung	2012	Include: Randomised controlled trials Include: Experimental; Quasi- experimental Include:	None specified None specified	1982–2010 1980–2010	School-age Children School-age Children		Literacy: Reading	Intervention: Reading (in schools) Intervention: Mathematics (in schools)	U	Н	Н	H	H	L	L
Cho	2018	experiemental designs with control group Include: Longitudinal; Retrospective	None specified None specified	2008–2013	None specified None specified	•	Learning: Second language Psychological health: ADHD Psychological health: ADHD Symptoms (Inattention)	Screen use: General (mobile phone for language learning) Screen use: General	U	H	U	Н	L	H	L
Clinton Comeras- Chueca	2019	Include: randomised experimental designs include: randomized and non-randomized controlled trials (control group with no	None specified None specified	2011–2016	None specified Under 18 (4.5-11.6)	•	Body composition: BMI Cardiometabolic	Screen use: Reading (vs paper) Video games: Physically active	U	L	U	L	L	L H	L
Comeras- Chueca	2021	intervention or traditional exercise intervention) Include: randomized and non-randomized controlled with control group with no	None specified	2010–2020	Under 18 (8.0-14.0)	•	Body composition: BMI Body composition: BMI z-score Body composition: Body fat percentage	Video games: Physically active	L	L	L	U	L	Н	L
Coyne	2018	intervention or traditional exercise intervention None Include: All	None specified	1975–2017	Children; Adolescents	•	Body composition: Fat-free mass Body composition: Waist circumference Prosocial Behavior: General	Screen use: Prosocial content	L	L	L	Н	L	L	L
Cushing Darling	2010	quantitative designs; Experimental Include: Intervention	None specified None specified	1989–2009 2006–2016	Children; Adolescents Children; Adolescents (8.7-16.0)	•	General Body composition	Intervention: Health behaviours Intervention: To promote health (via mobile phone)	U	L	H U	H	L	L H	Н
de Oliveira Eirich		Include: Observational Include: experimental or observational	None specified None specified	2010–2014 1978–2021	Adolescents 12 or under (0.5-11.0)	•	Syndrome Psychological health:	Screen use: General Screen use: General	U	L	L	L	L	L	L
Fang Feng		Include: Cohort; Case-control; Cross-sectional Include: Quantitative designs	None specified None specified	2006–2019	Children; Adolescents 1 month - 4.99 years old	•	Body composition: Body composition: BMI z-score	Computer use: General Screen use: General TV programs and movies: General Screen use: General (meeting guidelines)	U	L	L	L	L	L H	L
Ferguson Ferguson	2017	None Include: Experimental, correlational, or longitudinal	None specified None specified	2005–2017	Children; Adolescents None specified (7.8-17.5)	•	activity (initiation of sex)	Screen use: Sexual content Video games: Violent content	U	U	L	H	L	L	L
Folkvord Foreman	2018	Include: Interventions Include: observational and intervention studies Include:	None specified None specified	2007–2018	Children; Adolescents None specified	•	(calories) Eye health: Myopia Literacy: Reading	Advertising: Advergames Screen use: General Screen use: General (phone or tablet)	U	L	L	U	L	Н	L
Furenes Gardella	2021	experimental or quasi- experimental Include: Cross- sectional	None specified Include: North America	2002–2019	1-8 years old Adolescents (12.5-16.2)	•	comprehension Literacy: Vocabulary learning	e-Books: General Internet use: Cyberbullying victimization	H	H	L	U	L	L	L
Garzón Ghobadi	2019	Include: Experimental with control group Include: Cohort; Case-control; Cross-sectional Exclude: Interventions Include:	None specified None specified	NA 2009–2014	Children; Adolescents School-age	•	Learning: General Body composition	Intervention: Augmented reality (in schools) TV programs and movies: Mealtime	U	H	U	H	H	L	L
Graham Haghjoo Hammersley		Experimental; Quasi- experimental Include: observational designs Include: Randomised	None specified None specified	2004–2011 2008–2021 2003–2013	Children (Primary/Element School) 10-20 years old Children;	•	Body composition: Overweight/obesity	Intervention: Writing feedback Screen use: General Intervention: To promote healthy weight (obesity	U L	L H L	H U H	H U L	L	L L	L
Hao Hassan- Saleh	2021	Include: Experimental with control group Include: Experimental; Quasi-	None specified None specified	2012–2018	Adolescents preschool- college Children; Adolescents	•	Learning: Second language vocabulary	weight (obesity prevention) Intervention: English as foreign language Intervention: Pronunciation	U	L	L	L	L	H	L
He Hernandez- Jimenez		experimental Include: Randomised controlled trials Include: Experimental; Quasi- experimental	None specified None specified	2009–2018	6-18 years (9.9-16.6) Children; Adolescents		Physical activity: General	Intervention: To promote physical activity (via mobile phone) Video games: Physically active	L	L	Н	L	L	L	L
Hurwitz Ivie	2018		Include: North America None specified	1997–2018 2012–2019	Early childhood/pre- school; School-age Children (Early Primary/Elemen 11-18 years (14.0-18.0)	11	Developing beath:	Intervention: Literacy videos Social Media: General	L	L	H	H	L	L	L
Janssen Kates	2020	Include:	None specified None specified	2007–2019	Children School-age Children Preschool to	•	Learning: General Learning: Literacy and	Screen use: General Screen use: General (mobile phone)	U	Н	L	Н	Н	U L	L
Kim Kroesberge	2021	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/Element (7.0-11.3)	•	Literacy: General Numeracy: General	Screen use: Educational apps Intervention: Mathematics (via computer in classrooms)	U	L	U	Н	L	H	L
Kucukalkan Lanca	2019	Include: Experimental Include: Cohort; Case-control; Cross-sectional; Intervention trials. Exclude: Case reports; Retrospective	None specified None specified	2007–2016	School-age Children (Primary/Elemen Children; Adolescents	n	Numeracy: General	Intervention: Mathematics Screen use: General	U	L	Н	U	H	L L	L
Li Li	2010	studies. Include: Experimental; Quasi- experimental None specified	None specified None specified	1991–2005 2005–2019	School-age Children Infants, toddlers, and preschoolers (0-7 years)	•	Body composition:	Intervention: Mathematics Screen use: General	U	L	L	U	L	H	L
Li		Include: Randomised controlled trials Include: experimental or	None specified None	2012–2020	3-18 years	•	Developmental: Gross motor (locomotor) Developmental: Gross motor (non-locomotor) Developmental: Gross motor (object control skills)	Intervention: Active video games for motor skills Computer use:	L	Н	L	L	L	Н	L
Liao Liao		quasi- experimental Include: All quantitative designs Include: Randomised controlled trials	specified Include: Taiwan None specified	2014–2021 1990–2003 1999–2012	None specified School-age Children (Primary/Elemen Children; Adolescents (4.0-14.7)	• n	Computational thinking Learning: General	Programming exercises Intervention: Education (via computer) Intervention: Screentime reduction	L	H H L	Н	L	H	H L	H
Liu Liu	2016	Include: Cross-sectional; Case-control; Longitudinal Include: All quantitative designs	None specified None specified	2001–2014	All (13.3-16.6)	•	Psychological health: Anxiety Psychological health:	Screen use: General Social Media: Instant messaging Video games: General	U	L	L	Н	L	L	L
Liu Liu	2022	Include: studies with control group Include: Observational	None specified None specified	NA 2012–2021	None specified 10-19 years	•	Cognition: Creativity Psychological health: Depression Psychological health:	Screen use: General Social Media: General (duration) Screen use: General	U	U	H	H	H	L L	L
Lu	2021	Include: Cross- sectional only Include:	China	2014–2018	Adolescents			(mobile phone addiction) Intervention: Education (general) Screen use: General Screen use: General (coviewing) TV programs and	U	L	U	L	L	L	L
Madigan	2020	Observational Exclude: Qualitative	None specified	1973–2019	Children (0.5-10.6)	•	Literacy: General	movies: Coviewing TV programs and movies: Educational TV programs and movies: General TV programs and movies: General (in background)	U	L	L	U	L	L	L
Major	2021	Randomised controlled trials Include: Cross-	middle- income per World Bank	2007–2020	5-18 years 1-6 years and prior to school	•	Cognition: Cognitive Functioning Cognition: Executive Functioning Developmental: General	(Abracadabra; in schools) Screen use: General	U	L	L	H	L	L	L
Mallawaarad	. ∠022	sectional or longitudinal	None specified	2014–2020	prior to school entry (1.4-5.4)	•	Developmental: Language or speech Psychological health: Psychosocial factors Psychological health: Self-regulation Sleep: General Aggression: Towards peers	(mobile phone or tablet)			L	L		L	
Mares	2005	None	None specified	1969–1989	Children	•	Cognition: Reducing	TV programs and movies: General	U	L	Н	Н	L	Н	Н
Mares Marker	2013	Exclude: Experimental None specified	Exclude: North America None specified	1973–2010 2001–15	Children None specified (6.0-12.2)	•	perception of out- groups Learning: General Learning: Literacy and numeracy Learning: Physical and social environment	Intervention: Sesame Street Video games: General	U	H	н	H	L	H	L
Marshall Martins Martins	2004 2019	Include: All quantitative designs Include: Crossover or parallel	None specified None specified	1985–2002 2003–2018 2006–2017	Children; Adolescents All	•	Physical activity: General Aggression: Towards peers Diet: Food intake	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		randomized controlled trials Include: Randomised controlled trials Include: Randomised controlled trials	None specified None specified None specified	2006–2017 2015–2019	1-18 years None specified (10.3-17.8) All (6.7-16.2)	•	(calories) Physical activity: General	TV programs and movies: Mealtime Intervention: To promote physical activity (via gamification) Intervention: Literacy (phonics; via computer)	L	L	L	L	L	L	L
McArthur McArthur Mei	2018			1994–2009 1994–2015 2004–2018		•	Literacy: General Sleep: Duration	-	L	L	L	L	L	L	L
Merchant	2014	Include: Experimental with control group	None specified	NA	K-12		Learning: General	Screen use: Virtual reality simulations (Educational) Screen use: Virtual reality worlds (Educational) Video games: Virtual reality (Educational)	U	L	н	н	Н	Н	L
Mori	20-1	None specified	None specified	2013–2018	<18 years	•	Psychological health: Internalizing Risky behavior: Alcohol consumption Risky behavior: Delinquency Risky behavior: Drug use Risky behavior: Sexual activity	Screen use: Sexting	U	Н		U			
۱۱ ال	19ں۔	_ specified	specified Include:	.⊍–∠018	<18 years (12.3-16.7)	•	Risky behavior: Sexual activity Risky behavior: Sexual activity (contraception use) Risky behavior: Sexual activity (multiple partners) Risky behavior: Smoking	use: Sexting	J	d		U		L	
Neitzel	2022	Include: random assignment or quasi-experimental	Include: United States,Europe Israel, Australia, and New Zealand	2004–2020	Kindergarten- Grade 6	•	Literacy: Reading Cognition: Cognitive Functioning Cognition: Executive Functioning	Intervention: Reading (technology supported)	U	L	н	н	L	Н	Н
Oldrati Paik	2020	control experimental design	None specified None specified	2006–2018 NA	School-age Children Children; Adolescents	•	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	Н	L	H
Pearce Peng	2016	Include: All quantitative designs None	None specified None specified	1986–2012 2001–2010	Children; Adolescents Children; Adolescents	•	Psychological health: Internalizing Cardiometabolic health: Maximum oxygen consumption Physical activity: Energy expenditure	TV programs and movies: Scary content Video games: Physically active	U	L	H	H	H	L	L
Poorolajal Powers	2020	Include: Observational Include: Experimental or quasi-	None specified	1995–2018 1985–2012	Children; Adolescents	•	Physical activity: Heart rate Body composition Cognition: Information	TV programs and movies: General Video games: General	U	L	L	U	L	L	L
Prescott	2018	quasi- experimental designs Include: Longitudinal	None specified None	2008–2017	AII (8.9-16.0)	•	Aggression: Towards peers Psychological health: Emotion experience	Video games: Violent content Intervention: To improve emotional regulation	U	L	U	Н	L	L	L
Reynard Rodriguez- Rocha	2019	Include: Experimental; Quasi- experimental Include:	None Specified None Specified None	2016–2020 1999–2018	All (4.5-15.4) Children;	•	Emotion experience Psychological health: Emotion regulation Diet: Fruit and vegetable intake	Intervention: To improve emotional regulation (via digital games) Intervention: Fruit and vegetable	U	L	L	L	L	L	L
Sadeghirad Scherer Schroeder		Include: Randomised controlled trials Include: Experimental or quasi- experimental designs Include: Experimental; Quasi-	None specified None specified None specified	1978–2014 1973–2017 2001–2009	Children; Adolescents (3.8-11.0) None specified (6.5-16.8)	•	choice Learning: Programming skills	Advertising: Unhealthy food Intervention: Education (programming) Intervention: With digital characters	H U	H L	U U	H H	L	L	L
Scionti	2019	Quasi- experimental Include: Interventions	None specified None	2009–2019	Children (4.3-6.1) Children;	•	Cognition: Executive functioning Body composition Diet: Sugary drinks	digital characters Intervention: Cognitive training Intervention: To promote health (via mobile phone app) Intervention: To	L	L	L	Н	L	L	L
Shin	2019	Interventions Include: Randomised controlled trials; Quasi-	None specified None specified	2013–2018	Children; Adolescents (12.0-15.7) School-age Children (Primary/Elemen	•	Diet: Sugary drinks Physical activity: General Screen time: General		U	Н	Н	Н	L	Н	Н
Strouse		experimental; Observational Include: experimental and quasi- experimental designs Include: Experimental; Quasi-	None specified None specified	1994–2019 1980–2014		•	Learning: General	(in schools) Screen use: Video (vs face-to-face) e-Books: Narration	U	L	U	н	H	L	L
Takacs	2019	experimental Include: Randomised controlled trials and quasi-RCTs.	None specified	2001–2016	Children	•	Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working	Intervention: Education (via computer)	L	L	U	н	L	L	L
Tekedere Tokac	2016	None Include: desgins with a control group	None specified None specified	2010–2015	All PreK-12th grade	•	Functioning (working memory) Learning: General	Intervention: Augmented reality (in schools) Video games: Educational	U	Н	U	U	L	L	L
Vahedi	2018	group Include: Interventions (pre-post or controlled). Exclude: Cross-sectional	None specified None	2015–2016	School-age Children (Middle/High School)	•	Risky behavior: Media literacy Risky behavior: Risk taking (attitude) Risky behavior: Risk taking (general) Risky behavior: Risky	Intervention: Media literacy (web-based)	L	L	U	U	L	L	L
Vannucci	2020	Exclude: Qualitative; Case studies Include: longitudinal, cohort, case- control, cross- sectional, or controlled trials	None specified None specified	2011–2018	Adolescents (12.6-18.0) <=18 years (9.5-16.8)	•	Risky behavior: Risky sexual behaviour Risky behavior: Substance abuse	Social Media: General Screen use: General (mobile phone)	U	L	L	H	L	L	L
Wouters Wouters	2013	controlled trials Include: experimental designs Include: Experimental with control group Include:	None specified None specified	2005–2012 1993–2007			Learning. Motivation	Video games: Educational Video games: Educational (with instructional support)	U	L	U	Н	L	L	L
,		Include: Experimental; Quasi- experimental; Pre-test post- test Include: experimental, quasi- experimental, or pre-post test	None specified None specified	2010–2018	Children (1.8-5.9) 0-5 (1.8-5.8)		Learning: General Learning: General	Intervention: Education (via touch screen) Screen use: Touchscreens	U	L	L	Н	L	L	L
Xie Xie		None specified Include: Cohort; Case-control;	None specified None specified	2006–2016	None specified Children	•	Psychological health: Positive mental health Body composition	Social Media: General TV programs and movies: General	U	H	U	н	L	L	L
Xie		Cross-sectional			2-19 years (3.8-17.1)	•	Psychological health: Other mental health problems	Screen use: General	U	L	L	U	L	L	L
Xie Xie Yin	2016	Cross-sectional Include: longitudinal or cohort designs Include: Observational or	None specified Mainland China, Hong Kong,	2001–2021	6-18 years (or	•	Body composition Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Eve health: Myonia	Screen use: General	U	Н	,		1		
Xie Xie Yin Zhang Zhang	2016 2022	Include: longitudinal or cohort designs Include: Observational or experimental designs Exclude: Non- empirical studies; Qualitative;	specified Mainland China, Hong		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 Healthy behavior: Self- efficacy		U	Н	L	L	L	L	L
Xie Xie Yin Zhang Zhang Zhang	2016 2022	Include: longitudinal or cohort designs Include: Observational or experimental designs Exclude: Non- empirical studies;	Mainland China, Hong Kong, Macau and Taiwan	2009–2020	grade 1-12)	•	Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Eye health: Myopia Physical health: Health Issues Psychological health: Emotion problems Healthy behavior: General Healthy behavior: Selfefficacy Psychological health: Enjoyment Psychological health: Depression	Video games: Health promoting content		H	U	H	L	L	L
Xie Xie Xie Yin Zhang Zhang Zhou Zhou Zier I Items are from 2 Where provi	2022 2022 2020 2020 2009	Include: longitudinal 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 designs Include: Randomised controlled trials; Quasi- experimental; Observational	Mainland China, Hong Kong, Macau and Taiwan None specified None specified None specified	2009–2020 2009–2018 2009–2021	grade 1-12) All <20 years (11.5-17.9) School-age Children (Primary/Elemen		Cardiometabolic health: Poor fitness Cardiometabolic health: Risks Eye health: Myopia Physical health: Health Issues Psychological health: Emotion problems Healthy behavior: General Healthy behavior: Selfefficacy Psychological health: Enjoyment Psychological health: Depression Literacy: Decoding Literacy: Reading comprehension	Video games: Health promoting content Computer use: General Screen use: General (mobile phone) TV programs and movies: General	U	L	U		L	L	L