First	cteristic	teristics s and quality assessr Design Restrictions			unique effects		stics for studies providing utcomes Assessed	unique effects Exposures Assessed	Elig. Crit. ³	Lit. Search	Dual	Dual Qual.6	sment ¹ Studie		Hetero
Abrami	2020	Include: Experimental designs	None specified	2009– 2019	Pre K to Grade 3	•	Literacy: Listening comprehension Literacy: Phonics Literacy: Phonomic awareness Literacy: Reading comprehension Literacy: Reading fluency Literacy: Vocabulary knowledge	Intervention: Literacy (Abracadabra; in schools)	L	U	L	Н	L	L	L
Renau	2020	Include:	None specified None specified	1982– 2019 2007– 2016	Adolescents (5.7-18.0) All (14.2-15.8)	•	Literacy: General Numeracy: General	Screen use: General TV programs and movies: General Video games: General Internet use: General	U	L	L	L	L	L	L
	2019	Interventions	Include: Overweight/obeso	2010– 2017 2008–	Children; Adolescents	•	Psychological health: Depression Psychological health: Enjoyment Self-perceptions: General Self-perceptions: Self-esteem	Video games: Physically active Video games:	U	L	L	U	L	Н	L
Aspiranti	2020	Include: Interventions Include: Observational	Include: Autism spectrum disorder Exclude: Medical conditions that may increase	2013– 2015 1999– 2019	School-age Children (Primary/Elen None specified	•	Learning: Motivation Learning: General Physical health: Lower	Educational (with competition) Intervention: Education (via touch screen) Screen use: General (excluding TV) TV programs and	U	H L	L	H H	L	H L	L
	2015	Experimental None	sedentary activities Exclude: Atypical population (except for delayed sleep phase disorder or insomnia)	2004–2014	Adolescents	•	Sleep: Bedtime Sleep: Duration Sleep: Time to fall asleep	movies: General Computer use: General Internet use: General Screen use: General (mobile phone) TV programs and movies: General Video games: General	L	L	U	U	L	U	U
Benavides- Varela	2022	controlled trials and quasi-RCTs. Include: Randomised controlled trials	Exclude: Any disease Mental disorders Include: Math difficulties Include: Regular students, poor readers or	1999– 2019 2006– 2018	Children	•	Numeracy: Mathematics Literacy: Pooding	Intervention: Nutrition (in schools) Intervention: Mathematics	U	Н	L	Н	L	H L	L
	2020		dyslexics Exclude: Severe or multiple disabilities Include: Chronic disease	2000 2011– 2018	(5.4-11.5) Children (10.0-15.7)	•	Body composition Cardiometabolic	Video games: Health promoting content	U	L	L	L	L	н	L
, and the second	2016	Include: All	None specified None specified	2004– 2015 2006– 2014	Cnildren	•	Diet: Food intake	Advertising: Unhealthy food Video games: Numeracy	H	L U	L U	Н	Н	L H	Н
Cao	2020	Include: designs with control groups	Exclude: Brain damage	2002– 2019	3-12 years (3.4-14.3)	•	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	Include: All quantitative designs	Include: Healthy populations only	2011– 2015	Adolescents (10.6-17.0)	•	Sleep: Lethargy Sleep: Poor quality Body composition Diet: Fat consumption Diet: Fruit and vegetable intake Diet: Fruit 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	Children (11.4-15.9)	•	snacks 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)	L	L	L	L	L	L	L
Chauhan	2014	Quasi- experimental Include: pre-post designs with or without control group Include:	None specified None specified	2002- 2012 2001- 2016	Elementary school students	•	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	L
Cheung	2012 2013	designs Include: Randomised controlled trials Include: Experimental; Quasi- experimental	None specified None specified	2019 1982– 2010 1980– 2010	School-age School-age	•	Literacy: Reading	Intervention: Reading (in schools) Intervention: Mathematics (in schools)	U	H L	L	Н	Н	L	L
	2018	designs with control group Include: Longitudinal; Retrospective	None specified None specified	2008– 2013 2004– 2018	specified	•	language Psychological health: ADHD	Screen use: General (mobile phone for language learning) Screen use: General	U	H	U	н	L	Н	L
Comoras	2019	experimental designs include: randomized and non-randomized controlled trials (control group with no intervention or	Exclude: Disabilities Exclude: Disabilities, diseases or disorders, overweight or obese	2011– 2016 2008– 2019	specified	•	performance Body composition: BMI	Screen use: Reading (vs paper) Video games: Physically active	L	L	U	L	L	Н	L
Comeras- Chueca	2021	exercise intervention) Include: randomized and non-randomized controlled with control group with no intervention or	Include: Overweight and obesity only Exclude: Participants with normal weight, participants with disabilities, diseases or	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:	Video games: Physically active	L	L	L	U	L	н	L
	2018		diseases of disorders other than obesity None specified None specified	1975– 2017 1989– 2009	Children; Adolescents	•	Waist circumference Prosocial Behavior: General	Screen use: Prosocial content Intervention: Health behaviours	L	L	L	н	L	L L	L
de	2017	Include:	populations only	2006– 2016 2010– 2014	Children; Adolescents (8.7-16.0)	•	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
Fang	2022	Cross-sectional Include:	Exclude: Non- typically developing children None specified	1978- 2021 2006- 2019	12 or under (0.5-11.0) Children; Adolescents	•	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	2021	Quantitative designs None Include: Experimental,	Include: Healthy children None specified	2017– 2019 2005– 2017	4.99 years old Children; Adolescents	•	activity (initiation of sex)	(meeting guidelines) Screen use: Sexual content Video games: Violent	U	L	L	Н	L	H	L
Folkvord	202020182021	Experimental, correlational, or longitudinal Include: Interventions Include:	None specified None specified None specified	2009– 2013 2007– 2018 2015– 2020	specified (7.8-17.5) Children; Adolescents	•	Diet: Food intake (calories)	Video games: Violent content Advertising: Advergames Screen use: General Screen use: General (phone or tablet)	U U	L	L	U	L	H H	L
	2021	Include: experimental or quasi- experimental	Exclude: Cochlear implants or autism Autism	2002– 2019 2006– 2014	1-8 years old Adolescents	•	learning Learning: Educational	e-Books: General Internet use: Cyberbullying victimization	H	H	L	U	L	L	L
	2019	Exclude: Interventions Include:	None specified None specified	NA 2009– 2014	Children; Adolescents	•	• Learning: General Body composition	Intervention: Augmented reality (in schools) TV programs and movies: Mealtime	U	H	U	H	H	L	L
	2015 2022 2016	Include: Experimental; Quasi- experimental Include: observational designs Include: Randomised	None specified None specified Exclude: Those with special needs, require a special diet, or have a condition	2004- 2011 2008- 2021 2003- 2013	Children (Primary/Elen School) 10-20 years old	•	Body composition:	Intervention: Writing feedback Screen use: General Intervention: To promote healthy weight (obesity	U L	L H	H U	H U L	L	L L	L
Hao	201620212019	Randomised controlled trials Include: Experimental with control group Include:			preschool-college	•	Learning: Second • language vocabulary		U	L	H L	L	L	Н	L
	2021 2019	experimental Include: Randomised controlled trials Include:	None specified None specified	2009– 2018 2009– 2017	6-18 years (9.9-16.6) Children; Adolescents Early	•	Physical activity: General	Intervention: To promote physical activity (via mobile phone) Video games: Physically active	L	L	L	L	L	L	L
lvie	2018	None Include: Correlational studies Include:	None specified None specified	1997– 2018 2012– 2019	childhood/preschool; School-age Children (Early Primary/Elem 11-18 years (14.0-18.0)	•	Psychological health: Depression	Intervention: Literacy videos Social Media: General	U	L	H	H	L	L	L
Kates	202020182021	Experimental; Cross-sectional; Longitudial None Include:	Include: Healthy children None specified None specified	2007– 2019 2008– 2016 2010– 2018	School-age Children Preschool to Grade 3 (3-9	•	Learning: General Learning: Literacy and	Screen use: General Screen use: General (mobile phone) Screen use: Educational apps	U	L H	L	L H	L H	U L	L
Kroesberge Kucukalkan	2003	experimental Include: Within subject design design Include:	Include: Students with math difficulties Include: Students with dyscalculia	1985– 1999 2007– 2016	School-age Children (Primary/Elen (7.0-11.3)	•	Numeracy: General • Numeracy: General	Intervention: Mathematics (via computer in classrooms) Intervention: Mathematics	U	L	U	H	Н	H	L
	2020	Include: Cohort; Case-control; Cross-sectional; Intervention trials. Exclude: Case reports; Retrospective studies. Include: Experimental; Quasi-	None specified None specified	2007– 2016 1991– 2005	Children; Adolescents	•		Screen use: General Intervention: Mathematics	U	L	H	U	L	L	L
Li	2020	experimental None specified Include: Randomised	None specified Include: Non- typically developing	2005 2005– 2019 2012– 2020	Infants, toddlers, and preschoolers (0-7 years)	•	Body composition: Overweight/obesity Sleep: Duration Developmental: Gross motor (locomotor) Developmental: Gross motor (non-locomotor)	Screen use: General Intervention: Active video games for motor	U	Н	U	L	L	L	L
Li	2022	Include: experimental or quasi- experimental Include: All quantitative			None specified School-age Children	•	Developmental: Gross motor (object control skills) Learning: Computational thinking	Computer use: Programming exercises Intervention: Education (via	U	н	L	H	L	H L	L
Liao	2014	designs Include:	None specified None specified None specified		(Primary/Elem Children; Adolescents (4.0-14.7) All (10.9-18.0)	•	Body composition Psychological health: Depression Psychological health:	Education (via computer) Intervention: Screentime reduction Screen use: General	U	L	H	L	L	L	L
Liu	2019 2022	designs Include: studies with control group Include:	None specified None specified None specified	2007- 2014 NA 2012-	All (13.3-16.6) None specified	•	Anxiety Psychological health: Depression Psychological health: Satisfaction Cognition: Creativity Psychological health: •	Social Media: Instant messaging Video games: General Screen use: General	U	L U	U H L	H	L H	L	L
	2022	Observational Include: Cross-	None specified Include: Healthy only	2012– 2021 2014– 2018	Adolescents	•	Psychological health: Negative coping style Psychological health: Positive coping style	(duration) Screen use: General (mobile phone addiction) Intervention: Education (general) Screen use: General	U	L	U	L	L	L	L
Madigan	2020	()hcervational	Exclude: Asd or intellectual disability	1973– 2019	Children (0.5-10.6)	•	• Literacy: General •		U	L	L	U	L	L	L
Major	2021	controlled trials	None specified	2007– 2020		•	Learning: General Cognition: Cognitive Functioning Cognition: Executive Functioning Developmental:	Intervention: Literacy (Abracadabra; in schools)	U	L	L	Н	L	L	L
Mallawaara	2022	Include: Cross- sectional or longitudinal	Include: Non- clinical	2014– 2020	and prior to school entry (1.4-5.4)	•	Developmental:	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
	2013	Experimental	None specified None specified	1973– 2010 2001–15	None specified (6.0-12.2)	•	perception of outgroups Learning: General Learning: Literacy and numeracy Learning: Physical and social environment Body composition	Intervention: Sesame Street Video games: General	U	H	Н	H	L	H	L
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	TV programs and movies: General Video games: General Screen use: General TV programs and movies: Mealtime	U	L	H U L	H H	H L	H L H	L
	2022	Include: Randomised controlled trials Include: Randomised	Exclude: Contraindictions to physical activity Intellectual and cognative impairments Include: Poor readers	2015– 2019 1994– 2009	(10.3-17.8)		Physical activity: General	Intervention: To promote physical activity (via gamification) Intervention: Literacy (phonics; via computer)	L	L	L	L	L	L	L
	2018	and quasi-RCTs. Include: Randomised controlled trials and quasi-RCTs. Include: cross-	Include: Poor readers None specified	1994– 2015 2004– 2018	Children; Adolescents	•	Literacy: General Sleep: Duration Sleep: Problems Sleep: Time to fall asleep	Intervention: Literacy Screen use: General (excessive)	L	Н	L	Н	L	L	L
Merchant	2014	Include: Experimental with control group	None specified	NA		•	Learning: General • Psychological health:	Screen use: Virtual reality simulations (Educational) Screen use: Virtual reality worlds (Educational) Video games: Virtual reality (Educational)	U	L	Н	Н	Н	Н	L
Могі	2019	None specified	None specified	2013– 2018	<18 years (12.3-16.7)	•	Psychological health: 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	assignment or	Include: Struggling readers	2004– 2020		•	use) Risky behavior: Sexual activity (multiple partners) Risky behavior: Smoking	Intervention: Reading (technology supported)	U	L	Н	Н	L	Н	Н
Oldrati	2020	Include: Group- control experimental	Include: Both typically developing and atypically developing with neurodevelopmen disorder	2006– 2018	School-age Children	•	Cognition: Cognitive Functioning Cognition: Executive Functioning Cognition: Verbal skills Cognition: Visuospatial skills Numeracy: General Psychological health: Adjustment	Intervention: Cognitive training	U	L	U	Н	L	L	L
	2016	Include: All	None specified None specified	NA 1986– 2012	Adolescents Children; Adolescents	•	Antisocial Behaviour: General Psychological health: Internalizing Cardiometabolic health: Maximum	TV programs and movies: Violent content TV programs and movies: Scary content	U	H	И	н	Н	L	H
-	2020	include: Observational	Include: Healthy populations only None specified	2001– 2010 1995– 2018	Children:	•	health: Maximum oxygen consumption Physical activity: Energy expenditure Physical activity: Heart rate Body composition	Video games: Physically active TV programs and movies: General Video games: General	U	L	U	U	L	H	L
	2013	experimental designs Include: Longitudinal	None specified None specified	1985– 2012 2008– 2017	All (8.9-16.0)	•	Aggression: Towards peers	Video games: General Video games: Violent content Intervention: To improve emotional	U	L	U	Н	L	L	L
Podriguez-	2019		Exclude: Neurological disorder None specified	2016– 2020 1999– 2018	8-14 years All (4.5-15.4)	•	Psychological health: Emotion experience Psychological health: Emotion regulation Diet: Fruit and vegetable intake	improve emotional regulation Intervention: To improve emotional regulation (via digital games) Intervention: Fruit and vegetable	U	L	L	L	L	L	L
	201620202013	Include: Randomised controlled trials Include: Experimental or quasi- experimental designs Include: Experimental; Quasi-	None specified Exclude: Clinical or special needs populations None specified	1978- 2014 1973- 2017 2001- 2009	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	L H	L U	Н	L	L L	L
Scionti	2019	Quasi- experimental Include: Interventions	None specified Include: No health conditions		Children (4.3-6.1) Children; Adolescents	•	Cognition: Executive functioning	Intervention: Cognitive training Intervention: To promote health (via mobile phone app) Intervention: To promote health (via	L	L	L	Н	L	L	L
	2019		conditions except obesity None specified		School-age Children (Primary/Elen	•	General Screen time: General •	mobile phone) Intervention: To promote health (via text message)	U	Н	Н	Н	L	Н	Н
	2021	Include: experimental and quasi- experimental designs Include:	Include: No developmental delay None specified	1994– 2019 1980– 2014		•	Learning: General Learning: General Cognition: Executive	Screen use: Video (vs face-to-face) e-Books: Narration	Н	L	U	Н	H	L	L
Takacs	2019	Include: Randomised controlled trials and quasi-RCTs.	None specified	2001– 2016	Children	•	Functioning (accuracy) Cognition: Executive Functioning (cognitive flexibility) Cognition: Executive Functioning (inhibition) Cognition: Executive Functioning (working memory)	Intervention: Education (via computer)	L	L	U	н	L	L	L
Tokac	2019	Include: desgins with a control group Include: Interventions (pre-post or	None specified None specified None specified	2010- 2015 2006- 2016	PreK-12th grade School-age Children	•	Numeracy: Mathematics Risky behavior: Media literacy	Intervention: Augmented reality (in schools) Video games: Educational Intervention: Media literacy (web-based)	U	H	U	U H	L	L	L
	2020	controlled). Exclude: Cross- sectional Exclude:	None specified None specified	2015– 2016 2011– 2018	(Middle/High School) Adolescents (12.6-18.0)	•	Risky behavior: Risk taking (attitude) Risky behavior: Risk taking (general)	Intervention: Media literacy (web-based) Social Media: General	U	L	U	Н	L	L	L
Wouters	2020 2013	longitudinal, cohort, case- control, cross- sectional, or controlled trials Include: experimental designs Include:	None specified Exclude: Disabilities	2016– 2020 2005– 2012	(9.5-16.8) None specified		impairment Learning: Motivation	Screen use: General (mobile phone) Video games: Educational Video games:	U	L	L U	Н	L	L	L
	2013	Experimental with control group Include: Experimental;	None specified None specified	1993– 2007 2010– 2018	Children (1.8-5.9)	•	Learning: General Learning: General	Educational (with instructional support) Intervention: Education (via touch screen)	U	H	U L	н	L	L	L
Yin	2018	experimental, quasi- experimental, or pre-post test None specified Include: Cohort;	Exclude: Health conditions None specified None specified	2010- 2018 2006- 2016	None specified	•	Psychological health: General Psychological health: Psychological health: Positive mental health	Screen use: Touchscreens Social Media: General TV programs and	U	L H	U	Н	L	L	L
	2016	Case-control; Cross-sectional Include: longitudinal or cohort designs	Exclude: Chronic conditions	2014 2001– 2021	2-19 years (3.8-17.1)	•	Psychological health: Other mental health problems Body composition Cardiometabolic health: Poor fitness Cardiometabolic	TV programs and movies: General Screen use: General	U	L	L	U	L	L	L
	2022	Observational or experimental designs Exclude: Nonempirical studies; Qualitative;	Exclude: Psychological or physical diseases None specified	2009- 2009- 2018	(or grade 1- 12)	•	Cardiometabolic health: Risks Eye health: Myopia Physical health: Health Issues Psychological health: Emotion problems Healthy behavior: General Healthy behavior: Self-	•	U	Н	L	L	L	L	L
	2020	Qualitative; Systematic reviews or meta- analyses Include: observational	None specified None specified	2009– 2018 2009– 2021	All	•	efficacy Psychological health: Enjoyment Psychological health: Depression	Video games: Health promoting content Computer use: General Screen use: General (mobile phone) TV programs and movies: General Video games: General	U	L	U	U	L	L	L
¹ Items are fro	2009 om the l ded teria pr	designs Include: Randomised controlled trials; Quasi- experimental; Observational National Health, Lune	ed	1997– 2006 e's Quality Ass	Children (Primary/Elen	• m	Literacy: Decoding	Video games: General e-Books: General	L ded the f	L irst item o	U of the too	H ol.	L	Н	L
	earch st ndent s	edefined and specifi rategy comprehensiv creening & review wality assessment red with important cl	ve and systematic	sults of each											