

Table S1. Information on included studies

First author	Publication year	Country	Target	Sample size	Study design	Studied variables	Primary results	Affected domain
Lo SMS (7)	2024	America	Firstborn children without siblings ('only children') and firstborn children with siblings ('non-only children') from mothers with at least one child who were surveyed biannually from 1986 to 2020	633	Longitudinal survey of 633 firstborn children, resulting in a total of 14,146 observations	Childhood's noncognitive performances, childhood's cognitive performances and academic scores, early adults' personalities, early adults' social	Being an only child was associated with lower self-esteem, more dependent and more insecure attachments, less sympathetic, easier to get angry and depressed, unambiguously poorer cognitive performances, and lower wages as an adult.	Mental and social health of a child

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						life, education, and income		
Chen M (15)	2021	China	Children and adolescents in primary and secondary schools of seven provinces/cities of China	11784	Cross-sectional survey	Lifestyle questionnaire survey, anthropometric measurements, and blood Samples, including high-density lipoprotein cholesterol (HDL-C), triglyceride (TG), and fasting	Only children are more prone to metabolic syndrome and its components	Physical health of the child

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						glucose		
Pihlman J (16)	2021	Finland	Children and adolescents aged 3, 6, 9, 12, 15, and 18 years with cardiovascular risk factors from childhood to adulthood	3,596	Longitudinal cohort population-based multicenter study	Weight, blood pressure, physical activity, total cholesterol, HDL-cholesterol, triglycerides, and serum glucose	Risk factors for heart disease were more common in only children than in those with siblings, both in childhood and in adulthood.	Physical health of the child
Rodrigues LP (17)	2021	Portugal	Children aged 3 to 6 years from nine preschools of a private school	161 (87 boys and 74 girls)	Cross-sectional survey study	Motor competence (stability skills, locomotor skills, and manipulative skills)	Having siblings leads to better motor competence	Physical health of the child

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Miller J (18)	2015	Australia	Children aged between 0 and 18 years were recruited from public and private clinics	302 cases and 676 controls	Case-control study	Early life microbial exposure, socioeconomic status, number of siblings, and juvenile idiopathic arthritis (JIA) status	Sibling exposure is associated with a reduced risk of JIA	Physical health of the child
Keenan K (19)	2020	Sweden	Swedish population register data, Swedish military conscription register, and Swedish cause of death register	532,659 182,870 1,910,086	Retrospective cohort born in 1940–75	height, physical fitness, being overweight/obese, and mortality	All-cause mortality hazard after passing age 50 was highest among only children. Only children had lower height than those with siblings.	Physical health of the child
Chanfreau J (20)	2022	UK	Four British cohorts with a sample size	55000	Four British cohort studies, born in 1946,	<u>BMI</u>	Only children showed a higher	Physical health of the child

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			between 5382 and 19,000 individuals.		1958, 1970, and 2000–2002		average BMI during school age, and then the difference disappeared.	
Meller FO (21)	2018	Brazil	All original studies that evaluated both birth order and number of siblings and their respective associations with body composition, overweight, and/or obesity published by July 2015 were included	20 articles included in qualitative analysis and 14 articles included in meta-analysis	Systematic review and meta-analysis	Overweight and obesity	Only children are at a slightly higher risk of being overweight/obese	Physical health of the child
Wang D (22)	2000	China	Seven Kindergartens in rural areas	579	Cross-sectional survey	Asking questions from the guardian of children regarding their psychological development. Only	Only children more frequently reported somatic complaints than those with siblings	Physical health of the child

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						children showed a higher score on somatic complaints.		
Kantojärvi L (23)	2008	Finland	Northern Finland 1966 Birth Cohort	1588	Retrospective cohort study of various official data registers	Psychiatric screening and personality disorders	Being an only child was associated with a higher prevalence of personality disorders in adulthood.	Mental health of a child and society
Molini-Avejonas DR (24)	2017	Brazil	Risk factors for speech-language disorders in children up to five years of age	238	Descriptive, retrospective, and prospective study from March 2010 to July 2014	Evaluation of language (phonology, fluency, pragmatic, and semantic), cognitive, hearing, com	Being an only child was one of the risk factors for speech-language disorders.	Mental/social health of the child

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						municative, voice, and orofacial myofunctional abilities.		
Rodrigues LP (25)	2020	Portugal	Children aged from seven to 15 years participated in Melgaço Youth Observatory (MYO), between 2015 and 2019.	a total of 542 children	Mixed-longitudinal growth and development project	Somatic measurements included height and weight for measuring BMI, physical fitness, and maturation	Only children showed poorer physical fitness indices compared to those with sibling(s)	Physical health of the child
Fukuya Y (26)	2021	Japan	Children in fourth grade in public schools in Adachi City, Tokyo, Japan, in 2018	3744	A population-based cross-sectional study	mental health problems, resilience, happiness,	Only children showed the highest total difficulties score in the Strengths and Difficulties Questionnaire (SDQ)	Physical/mental/social health of the child

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						and self-esteem		
Cheng S (27)	2020	China	College students from three universities in Jinan, Shandong, China	645	A cross-sectional study	Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale	College students who were only children had higher levels of anxiety symptoms and depressive symptoms	Mental health of a child and society
Mangolian Shahrabaki P (28)	2022	Iran	Primary school girls aged 7 to 11 years old in southeastern Iran	340	A descriptive correlational study	Fear of coronavirus, and the Coronavirus Disease Anxiety Scale	The mean score of fear and anxiety of Coronavirus disease was higher in only-child primary school girls.	Mental health of a child
Sheng L (29)	2022	China	Firstborn children and only children (6–12 years of age)	1,155 (477 firstborn children and 678 only children)	A prospective follow-up study	Behavioral and emotional problems	The scores of internalizing problems, externalizing problems, and total behavioral problems were higher in only children than in those	Mental health of a child

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							of firstborn children.	
Wu S (30)	2022	China	Newly enrolled kindergarteners followed from three to six years old	20,324	A large-scale population-based cohort	Psychosocial well-being and school readiness	Only children showed higher psychosocial problems and lower school readiness scores compared to children with an older sibling	Mental/social health of the child and society
Wang Y (31)	2022	China	School-aged children (grades 1 to 6) and their parents in Wenzhou	2913	A school-based, cross-sectional, and population-based study	Optical axial length, spherical equivalent refraction, parental myopia, and close-work activities	Only children showed a higher probability of myopia than children with siblings	Physical health of the child
Zhao LQ (32)	2018	China	Junior high school students, starting with two cohorts—7th and 9th graders	20,000	China Education Panel Survey (CEPS): A national, representative, longitudinal survey	Self-reported myopia status	Being an only child increases the chance of myopia by	Physical health of the child

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							nearly ten percent.	
Wei Y (33)	2016	China	Women (or their spouses) over the age of 49 with nonagricultural household registration (hukou) who had lost their only child and had not suffered child-loss in Shaanxi Province	476 (282 non-bereaved parents and 194 bereaved parents with only one child)	A cross-sectional survey study	well-being as measured by five dimensions, including physical well-being, psychological well-being, economic well-being, social support, and old age security	Bereaved parents of only children were deeply vulnerable in terms of physical and psychological well-being	Physical/mental/social health of parents
Li J (34)	2021	USA	Parents' experiences from 2 weeks to 11 years after their only child died in the US.	30 parents who lost their only child	Qualitative study	----- ----- -	Bereaved parents experienced a battery of physical and	Physical/mental health of parents

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							psychological problems	
Qi R (35)	2021	China	Han Chinese adults who had lost their only child (40–67 years)	144 (51 adults with PTSD and 93 non-PTSD adults [trauma-exposed controls]) and 50 controls without trauma exposure	Case-control study	neuropsychological tests, including the Hamilton Depression and Hamilton Anxiety rating scales, and the Mini-Mental State Examination, social support level, and individual coping ability	After the death of only children, their parents may experience disrupted hippocampal network connectivity	Mental health of parents

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Jiang Q (36)	2014	China	Period life-table data from China's 2000 population census	Population Census data	Secondary analysis using an extension of Goldman & Lord (1983)'s method to measure widowhood	Age-specific and cumulative probabilities of mothers losing their only child	Mothers face losing their male or female only child with a probability of 15 or 12 percent.	Physical/mental/social health of parents
Gui T (37)	2016	China	Chinese young adults who were studying or working in Montreal, Canada ($N = 20$), and whose parents were still living in China	20	Qualitative study	What are the challenges for transnational families regarding the care of their aging parents?	Several participants stated that their parents and parents' siblings disagree with sending them to long-term elder care institutions, and traditional family values are important in Chinese culture.	Social health of parents
Bobbitt-Zeher D (38)	2016	USA	Data from the General Social Surveys (GSS) from 1972 to 2012	approximately 57,000 adults at 28 points over the four decades.	Secondary analysis	family composition and marital	Each sibling that is added reduces the probability of divorce by 3% for the	Social health of a child

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						outcomes	siblings in the future.	
Skalkidou A (39)	2000	Greece	High school students aged between 15 and 17 years	358	Twin case-control study	Marital status of the parents	Men who grew up as only children are three times more prone to divorce than men with siblings.	Social health of the child and society
Kemppainen L (40)	2001	Finland	5587 male subjects who were alive and living in Finland at the age of 16 and who did not decline the use of data obtained during the 31-year follow-up	5587	unselected, general population, prospectively collected large birth cohort.	Registered crimes, perinatal risk, and maternal and paternal psychological risk factors	Growing up as an only child increases the odds of criminal violent behavior among male subjects.	The social health of a child in society
Zhao S (41)	2022	China	Students from the 2019 National College Student Survey on Sexual and Reproductive Health	49,569	Cross-sectional survey	Sex-related knowledge, attitudes, behaviors, and sexual	Only-child students had more liberal sexual attitudes (e.g., agreed with sexual intercourse during university)	Social health of the child and society

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						reproductive health outcomes		
Li S (42)	2013	China	Female college students in Wuhan	4,769	Cross-sectional survey	Sex-related knowledge and attitude; 3) sex-related behavior and risks.	Only-child female undergraduates were more likely to have a boyfriend and experience sexual intercourse compared to students with siblings.	Social health of the child and society
Feng Z (43)	2022	China	Chinese medical students	450	Cross-sectional online surveys	mobile phone addiction, depression, sleep quality, and peer relationships.	The rate of mobile phone use and the associated depression was higher in only children.	Mental/physical health of the child
Lee J (44)	2021	South Korea	Middle and high school students whose families were regarded	129 boys	Cross-sectional survey study	Depression and smart phone	Being an only child intensified the causal	Mental health of a child

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			as having a low income			e addiction	relationship between smartphone use and depression.	
Lao, Y (45)	2022	China	Junior high school students (7th and 9th grades) from only-child and two-child families	20,000	A school-based and nationally representative survey	Educational performance scores in Chinese, English, and mathematics courses	Educational outcomes of only children were poorer than those of students with siblings.	Social health of the child and society
Cameron L (4)	2013	China	Individuals born just before and just after the one-child policy were recruited from the general population of Beijing	421	Experimental study	Conducting four games, including the dictator or Game, trust game, risk game, and competition	Only children were less trusting, less risk-taking, and less trustworthy, and less competitive than those who had siblings.	Social/mental health of the child and society

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						game, to measure trust, risk-taking, competitiveness, and altruism.		
Tani Y (46)	2022	Japan	Caregiver siblings (parents)	8082 parents	Secondary analysis on the Adachi Child Health Impact of Living Difficulty (A-CHILD) study	Individual-level social capital, including social cohesion, social support, and group affiliation	Only children showed lower social capital indices than those growing up with one to three siblings.	Social health of the child and society
Pantke PM (47)	2023	Germany	The nationwide and representative German KiGGS study, including adolescents aged between 11 and 17 years	7311	A cross-sectional observational study	Blood pressure was measured non-invasively	Higher diastolic and mean blood pressure was recorded in only child adolescents compared to	Physical health of the child

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						using the Datascope Accuratorr Plus sphygmomanometer with a portable monitor (SOMA Technology, Bloomfield, CT, USA), providing accurate blood pressure measurements in the brachial artery by detecting oscill	those with siblings	

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						ometric pulsations during cuff deflation		
Park J (48)	2023	South Korea	2019 Korea Youth Risk Behavior Survey, including middle and high school students	38,211 middle and high school students	A nationwide cross-sectional survey	Self-reported health outcomes and risky behaviors, including alcohol use, asthma, body mass index, sexual activity, smoking, and suicide attempt.	Asthma and sexual activity had a significant association with only-child status.	Physical/mental health of the child and society

Table 2: A brief of general characteristics of included studies (n=36)

Variable	Frequency (%)
<i>Study regions</i>	
Africa	0 (0)
America	5 (13.9)
Asia	21 (58.3)
Europe	9 (25.0)
Oceania	1 (2.8)
<i>Study's publication time</i>	
2000–2010	4 (11.1)
2011–2020	13 (36.1)
2021–2024	19 (52.8)
<i>Study design</i>	
Cross-sectional/descriptive/observational	15 (41.7)
Case-control	3 (8.3)
Prospective/retrospective longitudinal cohort	11 (30.6)
Experimental	1 (2.8)
Secondary analysis	3 (8.3)
Systematic review/meta-analysis	1 (2.8)
Qualitative	2 (5.5)