Supplementary material 1 Search strategy used in Medline. The same strategy was used for the three databases, and 2486, 1385 and 597 articles were found with Medline (Pubmed), Cochrane Library and Sport Discus, respectively.

Search	Query	Results
#4	Search (#1 AND #2 AND #3)	**2,486**
#3	Search: ((((“Muscle Strength”) OR “Strength” OR “Force” OR “Isometric Force” OR “Maximal Voluntary Contraction” OR “MVC” OR “Power” OR “Velocity” OR “Isometric” OR “Concentric” OR “Eccentric” OR “Isokinetic” OR “Isotonic” OR "time to task failure" OR "time to exhaustion" OR "endurance time")))	**1,132,400**
#2	Search: “neuromuscular fatigue” OR "fatigue" OR "Exercise-Induced Fatigue" OR "fatigability" OR "muscle fatigue" OR "cycling exercise" OR "running exercise" OR "aerobic exercise" OR "anaerobic exercise" OR "isometric exercise" OR "dynamic exercise"	**121,925**
#1	Search: "children" OR "child" OR “adolescent” OR “pubescent” OR “prepubescent” OR “prepubertal” OR “pubertal” OR “youth” OR “teen”	**3,723,213**

Supplemental material 2 Newcastle Ottawa Quality Assessment Scale (modified for cross-sectional studies)

Selection: (Maximum 4 stars)

1) Representativeness of the sample:

a) Representative of the average in the target populations (e.g. random sampling). ⇨★

b) Selected group of users. (e.g. local groups, university/school population) or no description of the sampling strategy. ⇨∅

2) Sample size:

a) Justified and calculated with appropriate methods. ⇨★

b) Not justified. ⇨∅

3) Ascertainment of participants' health status.

a) Validated measurement tool to ensure subject' health status (e.g. medical report, specific questionnaire). ⇨★★

b) Basic reporting of the health status (e.g. "healthy participants were recruited). ⇨★

c) No description of participants' health status. ⇨∅

Comparability: (Maximum 2 stars)

1) Comparability of age groups based on controlling for confounding factors.

a) The study controls for physical activity status (e.g. specific physical activity questionnaire, accelerometry) and fitness level (e.g. maximal oxygen uptake) with a validated measurement tool (e.g. cardiopulmonary exercise testing with gas exchange measurement). ⇨★

b) The study controls for any additional factors (caffeine and alcohol consumption before the test and physical activity prior testing, any contraindication to physical activity). ⇨★

Outcome: (Maximum 3 stars)

1) Assessment of the main outcome:

a) Reliability of the fatiguing exercise in both children and adults (i.e. in the case of the authors reported the reliability of the fatiguing protocol using previous preliminary data or data published by other authors). ⇨★

b) Validated tool to measure time to task failure and/or performance fatigability (e.g. isometric/isokinetic ergometer, custom-built devices with force sensors). ⇨★

c) Non-validated tool or no description. ⇨∅

2) Statistical test:

a) The statistical test used to analyze the data is clearly described and appropriate, and the probability level (p-value) or effect size is reported. ⇨★

b) The statistical test is not appropriate, not described, or incomplete. ⇨∅

Supplementary material 3 Quality assessment of all included studies.

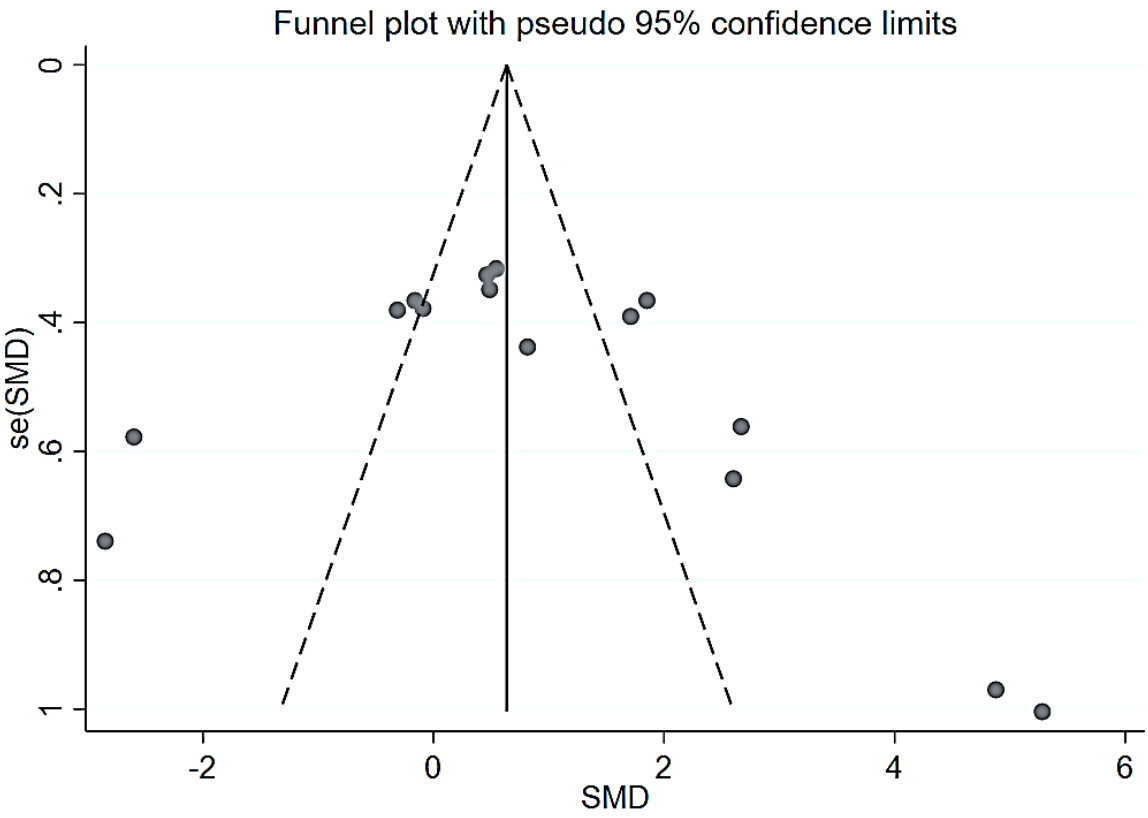
	Selection				Comparability		Outcome			
Study	Representativeness of the sample (★)	Sample size (★)	Health status (★★)		Comparability of age groups (★★)		Main outcome (★★)	Statistical test (★)		Total quality score (out of 9)
Armatas et al. [22]	–	–	★	**1**	–	**0**	★	★	**2**	**3**
Äyrämö et al. [48]	–	–	★	**1**	★	**1**	★	★	**2**	**4**
Bar-Yoseph et al. [7]	–	–	★★	**2**	★★	**2**	★★	★	**3**	**7**
Berthoin et al. [8]	–	–	★	**1**	★	**1**	★	★	**2**	**4**
Birat et al. [50]	–	–	★	**1**	★★	**2**	★★	★	**3**	**6**
Bontemps et al. [23]	–	–	★★	**2**	★	**1**	★	★	**2**	**5**
Buchheit et al. [88]	–	★	★	**2**	★	**1**	★	★	**2**	**5**
De Ste Croix et al. [51]	–	–	★	**1**	–	**0**	★	★	**2**	**3**
Dipla et al. [52]	–	–	★★	**2**	★	**1**	★★	★	**3**	**6**
Ftikas et al. [53]	–	–	★	**1**	–	**0**	★	★	**2**	**3**
Gorianovas et al. [18]	–	–	★	**1**	–	**0**	★	★	**2**	**3**
Halin et al. [21]	–	–	★	**1**	–	**0**	★	★	**2**	**3**
Hatzikotoulas et al. [19]	–	–	★	**1**	–	**0**	★	★	**2**	**3**
Hatzikotoulas et al. [9]	–	–	★	**1**	★	**1**	★	★	**2**	**4**
Hebestreit et al. [54]	–	–	★	**1**	★★	**2**	★★	★	**3**	**6**
Kanehisa et al. [95]	–	–	★	**1**	–	**0**	★	★	**2**	**3**
Lazaridis et al. [14]	–	–	★	**1**	★	**1**	★	★	**2**	**4**
Leclair et al. [11]	–	–	★	**1**	★	**1**	★	★	**2**	**4**
Liamopoulou et al. [55]	–	–	–	**0**	–	**0**	★	★	**2**	**2**
Marginson et al. [56]	–	–	★★	**2**	★	**1**	★	★	**2**	**5**

Murphy et al. [15]	–	–	★★	2	★	1	★	★	2	5
Patikas et al. [12]	–	–	★	1	★	1	★	★	2	4
Piponnier et al. [24]	–	–	★	1	★	1	★	★	2	4
Piponnier et al. [25]	–	–	★	1	★	1	★	★	2	4
Piponnier et al. [26]	–	–	★	1	★	1	★	★	2	4
Pullinen et al. [44]	–	–	★	1	★	1	★	★	2	4
Pullinen et al. [16]	–	–	★	1	★	1	★	★	2	4
Ratel et al. [28]	–	–	★★	2	★	1	★	★	2	5
Tanina et al. [10]	–	–	★	1	★	1	★	★	2	4
Tibana et al. [45]	–	–	★★	2	★	1	★	★	2	5
Weinstein et al. [57]	–	–	★★	2	★★	2	★★	★	3	7
Willcoks et al. [17]	–	–	★	1	–	0	★	★	2	3
Woods et al. [47]	–	–	★	1	★★	2	–	★	1	4
Woods et al. [46]	–	–	★	1	★★	2	–	★	1	4

Rating frequency for each domain considering the McPheeters classification- ***Number of study (total percentage)***

	Selection	Comparability	Outcome
Good	0 (0)	6 (18)	5 (15)
Fair	9 (26)	19 (56)	27 (79)
Poor	25 (74)	9 (26)	2 (6)

Supplemental Material 4 Funnel plot representation (with pseudo 95% confidence limits) for TTF differences between children and adults.



Supplemental Material 5 Funnel plot representation (with pseudo 95% confidence limits) for fatigability differences between children and adults.