

Table A.2.a. Physical fitness and sedentary behaviour, children and adolescents

Questions: What is the association between **sedentary behaviour** and health-related outcomes? Is there a dose response association (total volume and the frequency, duration and intensity of interruption)? Does the association vary by type and domain of sedentary behaviour?

Population: Children aged 5-under 18 years of age

Exposure: Greater volume, decreased frequency, duration or intensity of interruption of sedentary behaviour

Comparison: Lesser volume, increased frequency, duration or intensity of interruption of sedentary behaviour

Outcome: Physical fitness (e.g., cardiorespiratory, motor development, muscular fitness)

***Importance:** CRITICAL

Black font is from original GRADE Evidence Profiles from Australian 24-Hour Movement Guidelines for Children (5-12 years) and Young People (12-17 years).(26) **Red font denotes additions based on WHO update using review of existing systematic reviews.**

No. of studies/ Study design No. of participants	Quality Assessment					Summary of findings	Certainty	US PAGAC evidence (27)
	Risk of bias	Inconsistency	Indirectness	Imprecision	Other			
Mean baseline age ranged between 6.7 and 17.7 years; where mean age was not reported, baseline age ranged from 6 to 18.5 years. Data were collected from longitudinal (n=3) and cross-sectional (n=18) study designs with up to 2 year follow up. Fitness was assessed as CFR (Andersen test, PACER, AMIS 2001 Cardiopulmonary Function test, FITNESSGRAM 20 m shuttle-run, submaximal cycle ergometer test, 3 minute step test, Leger shuttle run, Physical Work Capacity 170 test); flexibility (EUROFIT test, Dordel-Koch test, Motorik-Modeule, FITNESSGRAM); muscular strength/endurance (EUROFIT test, Dordel-Koch test, hand grip strength, Motorik-Modeule, FITNESSGRAM); power (EUROFIT test, Dordel-Koch test). All outcomes were measured objectively.								
3 Longitudinal ^a n = 4,327 No eligible reviews identified.	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	Dose-response gradient ^b	CRF For prospective findings, higher sedentary behaviour was associated with lower fitness for: 1) <u>Accelerometer-derived sedentary time</u> - 1/1 study. 2) <u>Screen time</u> - 3/3 studies.	MODERATE^f	Outcome not included
18 Cross-sectional ^c n = 55,636 ^e No eligible reviews identified.	No serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	Exposure/outcome gradient ^d	CRF Higher sedentary behaviour was associated with lower fitness for: 1) <u>Accelerometer-derived sedentary time</u> - 2/5 studies (only in females for 1 study). 2) <u>Screen time</u> - 3/3 studies. 3) <u>TV</u> - 3/3 studies (only in females for 1 study). 4) <u>Video game</u> - 2/2 studies (only for males on weekdays in 1 study). 5) <u>Computer</u> - 0/1 study. 6) <u>Total sedentary behaviour</u> - 1/1 study. Muscular Strength/Endurance Higher sedentary behaviour was associated with lower fitness for: 1) <u>Accelerometer-derived sedentary time</u> - 0/1 study.	MODERATE^g	

					<p>2) <u>Screen time</u> - 2/2 studies. 3) <u>TV</u> - 1/3 studies (not for grip strength in 1 study). 4) <u>Computer</u> - 2/2 studies (not for strength of arm in 1 study). 5) <u>Video game</u> - 0/2 studies.</p> <p>Flexibility Higher sedentary behaviour was associated with lower fitness for: 1) <u>Accelerometer-derived sedentary time</u> - 0/1 study. 2) <u>Screen time</u> - 1/1 study. 3) <u>Computer</u> - 1/1 study.</p> <p>Other Higher sedentary behaviour was associated with lower fitness for: 1) <u>Accelerometer-derived sedentary time</u> and peak expiratory flow - 0/1 study. 2) <u>Screen time</u> and overall fitness score - 1/1 study. 3) <u>TV</u> and overall fitness score - 1/1 study. 4) <u>TV</u> and higher resting HR - 1/1 study.</p>		
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Abbreviations: CRF = cardiorespiratory fitness; HR = heart rate; TV = television viewing.

*As determined by WHO

^aIncludes 3 longitudinal studies (29-31).

^bA dose-response gradient of higher screen time with lower fitness was observed in 1 longitudinal study (31).

^cIncludes 18 cross sectional study (32-49).

^dA gradient of higher accelerometer-derived sedentary time, screen time, or TV with lower fitness was observed in 7 cross-sectional studies (33, 36, 39, 41, 44, 46, 47).

^eTwo studies used the German Health Interview and Examination Survey for Children and Adolescents (41, 44).

^fThe quality of evidence for longitudinal studies was upgraded to "moderate" from "low" due to no serious risk of bias.

^gThe quality of evidence for cross-sectional studies was upgraded to "moderate" from "low" due to an exposure/outcome gradient.