

Table A.2.h. Prosocial behaviour 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: Prosocial behaviour (e.g., conduct problems, peer relations, social inclusion)

***Importance:** IMPORTANT

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	Quality Assessment					Summary of findings	Certainty	US PAGAC evidence (27)
	Risk of bias	Inconsistency	Indirectness	Imprecision	Other			
<p>Mean baseline age ranged between 5 and 14 years; where mean age was not reported, baseline age ranged from 4 to 18 years and grades 6 to 10. One study did not report age or grade, rather that the sample was male guidance school students. Data were collected by randomized controlled trial (n=1), cross-over trial (n=1), longitudinal (n=10), and cross-sectional (n=12) study designs with up to 21 years follow up. Behavioural conduct/pro-social behaviour was assessed as ADHD symptoms (parent- and teacher-reported ADHD-IV Rating Scale, parental reported Strengths and Difficulties Questionnaire), time on task (direct observation), conduct problems (parent-reported Strength and Difficulties Questionnaire), peer relationship problems (parental-reported Strength and Difficulties Questionnaire), pro-social behaviour (parental-reported Strengths and Difficulties Questionnaire), criminal conviction (computer system), antisocial personality (modified Diagnostic Interview Schedule, self-reported Negative Life Events instrument), personality traits (self-reported Multidimensional Personality Questionnaire), behavioural problems (parental-reported Behavioural Problems Index, parental-reported 11-item symptomology checklist, self-reported Achenbach's Youth Questionnaire), aggression/violence (teacher-reported, self-report questionnaire, self-reported Buss and Perry's Aggression Questionnaire, parental-reported Child Behavior Checklist, self-reported State-Trait Anger and the Anger Expression Scale), attention/inattention/hyperactivity problems (teacher-reported questionnaire, self- and parental-reported Child Behavior Checklist, parental-reported Strength and Difficulties Questionnaire, self-reported ADHD symptoms scale, parental-reported ADHD Rating Scale-IV and parent and child attention symptomology checklist), impulsiveness (self-reported Barratt Impulsiveness Scale - II), serious and covert conduct (self-report questionnaire), bullying perpetration (self-reported Kidscape Questionnaire), social problem/withdrawn/delinquent behaviour (parental reported Child Behavior Checklist).</p>								
1 Randomized controlled Trial ^a n = 202 No eligible reviews identified.	No serious risk of bias	Unable to assess	Serious indirectness ^b	No serious imprecision	None	Smaller decrease in unfavourable measures of behavioural conduct/pro-social behaviour for the sedentary art group compared to the physical activity group for: 1) Non-Screen time - 1/1 study (not for parental- or teacher-reported hyperactivity/impulsivity, oppositional behaviour, moodiness, behaviour toward peers, and reputation with peers and not for teacher-reported inattention).	LOW^c	Outcome not included
1 Cross-over Trial ^d n = 96 No eligible reviews identified.	No serious risk of bias	Unable to assess	No serious indirectness	No serious imprecision	None	Unfavourable measures of behavioural conduct/pro-social behaviour for the sedentary group compared to the physical activity group for: 1) Non-Screen time - 1/1 study (only for 10-minute exercise break group).	VERY LOW^e	

14 Longitudinal ^f n = 43,784 No eligible reviews identified.	Serious risk of bias ^g	No serious inconsistency	No serious indirectness	No serious imprecision	Dose-response gradient ^h	For <i>longitudinal findings</i> , higher sedentary behaviour was associated with unfavourable measures of behavioural conduct/pro-social behaviour for: 1) <u>Screen time</u> - 4/4 studies (not for emotional symptoms, hyperactivity/inattention, peer relationship problems or pro-social behaviour in 1 study). 2) <u>TV</u> - 5/6 studies (not for violent conviction by age 26yr in 1 study, not for emotional symptoms, hyperactivity/ inattention, peer relationship problems, or pro-social behaviour for 1 study, only in females for 1 study). 3) <u>Video games</u> - 6/9 studies (not for serious or covert conduct problems in 1 study). For longitudinal findings, higher sedentary behaviour was associated with favourable measures of behavioural conduct/pro-social behaviour for: 1) <u>Computer</u> - 1/2 studies (only in females for 1 study).	LOW ⁱ
12 Cross-sectional ^j n = 95,287 No eligible reviews identified.	Serious risk of bias ^k	No serious inconsistency	No serious indirectness	No serious imprecision	None	Higher sedentary behaviour was associated with unfavourable measures of behavioural conduct/pro-social behaviour for: 1) <u>Screen time</u> - 1/3 studies. 2) <u>TV</u> - 4/6 studies (not for withdrawn in 1 study, not for parental-reported attention problems, or antisocial personality in 1 study). 3) <u>Computer</u> - 3/5 studies (not for anger in and anger control in 1 study). 4) <u>Video game</u> - 3/4 studies (not for behavioural problems or attention problems in 4 to 8 and 13 to 18 yr olds in 1 study, not for parental-reported attention problems, or antisocial personality in 1 study). 5) <u>Higher tech time</u> - 1/1 study each (not for behavioural problems in 4 to 8 yr olds or attention and behavioural problems for 9 to 12 yr olds).	VERY LOW ⁱ

Abbreviations: ADHD = attention deficit/hyperactivity disorder; TV = television viewing.

^fAs determined by WHO

^gIncludes 1 randomized controlled trial (245).

^hIt is unclear if children were engaging in sedentary time during the whole before school period and whether the art class was just replacing other sedentary time.

ⁱThe quality of evidence for the randomized controlled trial was downgraded to "low" from "high" due to serious indirectness and inability to assess inconsistency (1 study).

^jIncludes 1 cross-over trial (246).

^kThe quality of evidence for the cross-over trial was downgraded to "very low" from "low" due to inability to assess consistency (1 study).

^lIncludes 14 longitudinal studies (79, 232, 247-254); Allen et al. 2015; Roser et al. 2016; Chaelin et al. 2018; Wu et al. 2018).

^mApart from 2 studies (247, 249) information on psychometric properties of the sedentary behaviour items were not provided.

ⁿA dose-response gradient was for higher TV, screen time, computer, and video games with unfavourable behavioural conduct/pro-social behaviour was observed in 69 studies (232, 249-253); Allen et al. 2015; Wu et al. 2018; Chaeli et al. 2018).

^oThe quality of evidence for the longitudinal studies was not upgraded from "low" to "moderate" due to serious risk of bias but was upgraded to "moderate" from "low" for dose-response gradient.

^pIncludes 12 cross-sectional studies (41, 125, 236, 240, 255-262).

^qApart from 4 studies (41, 236, 240, 260) information on psychometric properties of the sedentary behaviour items were not provided.

^rTwo studies used the German Health Interview and Examination Survey for Children and Adolescents (41, 262).

^sThe quality of evidence for cross-sectional studies was downgraded to "very low" from "low" due to serious risk of bias.