

Table A.2.f. Mental health 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: Mental health (e.g., depressive symptoms, self-esteem, anxiety symptoms, ADHD)

***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	Quality Assessment					Summary of findings	Certainty	US PAGAC evidence (27)
	Risk of bias	Inconsistency	Indirectness	Imprecision	Other			
Self-esteem								
Mean age ranged between 9.87 and 16.4 years; where mean age was not reported, age ranged from 12 to 19 years and grades 3 to 5. Data were collected by cross-sectional design (n=10). Self-esteem was assessed as overall/global/general and social self-esteem (Rosenberg Self-Esteem scale, Culture Free Self Esteem Inventories for Children, Marsh's Physical Self-Description questionnaire; Harter Self-Perception Profile for Children questionnaire, Harter's Self-Competence scale); general self-efficacy (Rosenberg's Self-Efficacy scale and Schwarzer's Generalized Self-Efficacy scale); offline and online social self-efficacy (Self-Efficacy Questionnaire for Children and Self-Efficacy scale); academic, social, physical appearance, athletic, and behavioural self-concept (Harter's Self-Competence scale, Rosenberg's Self-Esteem scale, Marsh's Physical Self-Description questionnaire). All measures were assessed through a self-reported questionnaire. Some studies modified the scales.								
10 Cross-sectional ^a n = 82,919	Serious risk of bias ^b	Serious inconsistency ^c	No serious indirectness	No serious imprecision	Exposure/Outcome Gradient ^d	<p>Stanczykiewicz et al. 2019 (22) (k=8; n = NR)^f: 5/8 studies found statistically significant association between SB and anxiety symptoms, although results were inconsistent across measures of SB within studies. Overall, the estimated average effect was not statistically significant ($r = 0.05$ [95% CI, -0.01 to 0.11], $p = 0.085$).</p> <p>Higher sedentary behaviour was associated with lower self-esteem for:</p> <ol style="list-style-type: none"> 1) <u>Accelerometer-derived sedentary time</u> – 0/2 studies. 2) <u>Accelerometer-derived sedentary bouts</u> – 0/1 study. 3) <u>Accelerometer-derived sedentary breaks</u> – 0/1 study. 4) <u>Screen time</u> – 2/2 studies (not physical self-concept in 1 study). 5) <u>TV</u> – 2/4 studies. 6) <u>Computer</u> – 3/5 studies (one for females only in 1 study, not for online game in 1 study, not for physical concept in 1 study). 7) <u>Video games</u> – 1/4 studies (only in self-concept and self-esteem in 1 study). <p>Higher sedentary behaviour was associated with higher self-esteem for:</p> <ol style="list-style-type: none"> 1) <u>Computer</u> – 1/5 studies (only for self-concept in 1 study) 2) <u>Video games</u> – 1/4 studies (only for online self-efficacy for 1 study) 3) <u>cell phone</u> – 2/2 studies (not for global self-esteem in 1 study and only for social self-concept in 1 study). 	VERY LOW ^e	Outcome not included

1 Longitudinal ^f n = 519	Serious risk of bias	Unable to assess	No serious indirectness	No serious imprecision	None	In boys, higher sedentary behaviour is associated with lower self-esteem (0/1) 1) Other Screen time (computers, video game consoles mobile devices) (1/1) 2) TV (0/1) In girls, higher sedentary behaviour was associated with higher self-esteem. 1) Other Screen time (computers, video game consoles mobile devices) (0/1) 2) TV (1/1)	VERY LOW ⁱ	
Psychological distress								
Mean age ranged between 13.54 and 18.43 years; where mean age was not reported, age ranged from 6 to 15 years. Data were collected by longitudinal design (n=6). Psychological Distress was assessed using different methods. Anxiety was assessed using the Self-Rating Anxiety Scale (SAS). Depression was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D) and the Mood and Feelings Questionnaire (MFQ). Psychopathological symptoms were measured using the Multidimensional Sub-health Questionnaire of Adolescents (MSQA). Psychopathological symptoms were measured using the Multidimensional Sub-health Questionnaire of Adolescents (MSQA).								
6 Longitudinal ^g n = 7,417	Serious risk of bias	No serious inconsistency	No serious indirectness	No serious imprecision	None	Higher sedentary behaviour associated with higher levels of psychological distress 1) Accelerometer-derived sedentary time – 0/2 studies 2) Screen time – 4/4 studies 3) Computer use for homework – 0/1 study 4) TV – 0/1 study	LOW ^j	

*As determined by WHO

^aIncludes 10 cross-sectional studies (125, 212, 223-230).

^bOf the nine studies that used a subjective measure of sedentary behaviour, only one study (229) reported psychometric properties for the items.

^cMixed findings were observed.

^dA gradient for higher screen time and TV with lower self-esteem was observed in 3 studies (212, 228, 230).

^eThe quality of evidence for cross-sectional studies was downgraded to “very low” from “low” due to serious risk of bias and serious inconsistent

^fIncludes one longitudinal study (Braig et al. 2018).

^g Includes 6 longitudinal studies (Sund et al. 2011; Hume et al. 2011; Gunnell et al. 2016; Wu et al. 2016; Zahl et al. 2017; Babic et al. 2017).

^h Review included studies among children, adolescents, and adults. Only 8 of 31 total included studies were among children or adolescents.

ⁱThe quality of evidence for the longitudinal study could not be upgraded from “low” to “moderate” due to serious risk of bias and was downgraded from “low” to “very low” due to inability to assess consistency (1 study).

^jThe quality of evidence for the longitudinal studies could not be upgraded from “low” to “moderate” due to serious risk of bias.