

Body weight, physical activity and sedentary behaviour among Australian secondary school students

Background

The National Secondary Students' Diet and Activity (NaSSDA) survey was established by Cancer Council Australia and the National Heart Foundation of Australia with the first data collection undertaken in 2009-10. The NaSSDA survey is designed to be a regular monitoring system in which to track Australian adolescents' body weight and dietary and physical activity behavior at both a state and national level. The 2012-13 NaSSDA survey has been jointly funded by state Cancer Councils through Cancer Council Australia, the National Heart Foundation of Australia, and the State and Territory Government Health Departments. This research memo reports on the prevalence of overweight/obesity among Australian secondary school students and their adherence to national physical activity and sedentary behaviour guidelines.

Methods

A nationally representative sample of 8,888 secondary school students in year levels 8 to 11, from 196 schools was surveyed in 2012-13. Data on students' dietary and physical activity behaviour were collected via a web-based survey. Anthropometric measurements of students' height, weight and waist circumference were taken by trained researchers, in a confidential setting. Active parental consent was required for students to participate in each component of the study. An audit of the school food and activity environment was also conducted.

Measures of height and weight were used to compute Body Mass Index (BMI), which was classified into weight categories according to international standard cut-offs developed for children and adolescents.^{1,2} The *Moderate-to-Vigorous Physical Activity* (MVPA) screening measure was used to assess physical activity levels. Students were asked "Over the past 7 days, on how many days were you physically active for a total of 60 minutes or more per day?". The MVPA measure has been shown to be reliable, valid and correlate well with objective measures of physical activity.³ A subscale of the *Adolescent Sedentary Activity Questionnaire* (ASAQ) was used to assess sedentary behaviour. Students recorded the amount of time they spend watching TV, videos and DVD's, playing video games and using the computer for leisure on a usual school day and weekend. This subscale has shown good to excellent test-retest reliability among school-aged young people.⁴ Both the MVPA and ASAQ measures allow direct comparison with *Australia's Physical Activity and Sedentary Behaviour Guidelines* which recommend adolescents accumulate at least 60 minutes of moderate to vigorous intensity physical activity every day and limit their use of electronic media for entertainment to no more than two hours a day.⁵

¹ Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ*, 320(7244): 1240-3.

² Cole TJ, Flegal KM, Nicholls D, Jackson AA. (2007). Body mass index cut offs to determine thinness in children and adolescents: international survey. *BMJ*, 335(7612): 194-201.

³ Prochaska JJ, Sallis JF, Long B. (2001). A physical activity screening measure for use with adolescents in primary care. *Archives of Pediatrics and Adolescent Medicine*, 155: 554-559.

⁴ Hardy LL, Booth ML, Okely AD. (2007). The reliability of the Adolescent Sedentary Activity Questionnaire (ASAQ). *Preventive Medicine*, 45: 71-74.

⁵ Department of Health. (2014). *Australia's Physical Activity and Sedentary Behaviour Guidelines*. Canberra: Commonwealth of Australia.

Data were analysed using Stata SE 12.1 and weighted by state, education sector, year level and sex to ensure the sample obtained reflected the population distribution.⁶ The clustering of students within each school was also adjusted for in all analyses. Logistic regression analyses were conducted to test for significant differences ($p < 0.01$) in proportions by sex, controlling for year level, body mass index (BMI), socio-economic position (SEP) and home location. A further logistic regression model investigated whether engaging in more than two hours of electronic media for entertainment on an average day (combined school day and weekend responses) was associated with low levels of physical activity (being active on three or less days). Changes in prevalence estimates between survey years (2009-10 vs. 2012-13) were also assessed.

Results

As highlighted in Table 1, 23% of all students were categorised as overweight or obese, with this prevalence higher among males than females. Just 18% of students reported meeting the physical activity recommendations over the past week, and adherence to the sedentary behaviour guideline was low on both school days (23%) and weekend days (11%). While males were performing better than females in terms of physical activity, the opposite pattern was found for sedentary behaviour.

Table 1: Key prevalence estimates among Australian secondary school students by sex, 2012-13

	Males (n=4,643)	Females (n=4,245)	All (n=8,888)
Body Mass Index (BMI)			
Overweight / obese	25.3%	19.5%*	22.6%
Physical activity			
≥ 60 mins physical activity / day	23.9%	11.2%*	18.1%
Sedentary behaviour			
≤ 2 hrs electronic media / school day	20.8%	26.4%*	23.4%
≤ 2 hrs electronic media / weekend day	9.8%	13.3%*	11.4%

Note: N's vary among behavioural outcomes due to missing data.

* Significant difference at $p < 0.01$.

Overweight or obese students were less likely than healthy weight students to be meeting physical activity recommendations (16.2% cf. 18.6%).

Students who reported spending more than two hours using electronic media for entertainment were more likely to be engaging in low levels of physical activity compared to students who were not exceeding daily recommendations for electronic media use (45.2% cf. 36.0%).

⁶ Australian Bureau of Statistics. (2014). *Schools, Australia, 2013*. Catalogue No. 4221.0. Canberra: Australian Bureau of Statistics.

As shown in Table 2, the proportion of students categorised as overweight or obese remained relatively stable between 2009-10 and 2012-13. While the prevalence of students' engaging in at least 60 minutes of physical activity each day significantly increased over time, it still remains low overall. Further, there was a coinciding decrease in the proportion of students meeting daily recommendations regarding the use of electronic media for entertainment on both school days and weekend days.

Table 2: Trends in key prevalence estimates among Australian secondary school students, 2009-10 to 2012-13

	Prevalence [†] (%)		Adj. OR [‡]	95% CI	P-value
	2009-10 (n=12,188)	2012-13 (n=8,888)			
Body Mass Index (BMI)					
Overweight / obese	23.4%	22.6%	0.95	0.84-1.07	0.397
Physical activity					
≥ 60 mins physical activity / day	15.4%	18.1%	1.24	1.09-1.40	0.001
Sedentary behaviour					
≤ 2 hrs electronic media / school day	28.9%	23.4%	0.77	0.67-0.88	<0.001
≤ 2 hrs electronic media / weekend day	17.2%	11.4%	0.64	0.56-0.73	<0.001

Note: N's vary among behavioural outcomes within each survey wave due to missing data.

Abbreviations: OR = odds ratio; CI = confidence interval.

[†] Unadjusted prevalence estimates.

[‡] Adjusted for sex, year level, BMI category, SEP, home location and school-level clustering.

Summary

- Overall, 23% of students were categorised as being overweight or obese, with this prevalence higher among males than females (25% cf. 19%).
- The proportion of students categorised as overweight or obese remained relatively stable between 2009-10 and 2012-13.
- Just 18% of students reported meeting physical activity recommendations over the past week and males were more likely to be meeting recommendations than females (24% cf. 11%).
- The proportion of students meeting recommended physical activity levels increased between 2009-10 and 2012-13 (15% cf. 18%), but remains low overall.
- Students who are overweight or obese are also less likely to be sufficiently active (16% cf. 19%).
- Only a minority of students met recommendations for use of electronic media for entertainment during the school week (23%) and on the weekend (11%), with females more likely than males to be meeting recommendations.
- Students who are exceeding recommended screen time are also more likely to have low physical activity levels (45% cf. 36%).