

Adherence to screen time recommendations for Australian children aged 0–12 years

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Australian Department of Health guidelines recommend that children under 2 years of age have no screen time, a limit of one hour per day for 2–5-year-old children, and a limit of 2 hours of recreational screen time per day for 5–17-year-old children.¹ As it has not been assessed in a nationally representative study, we examined adherence to these recommendations among children aged 0–12 years, as well as the characteristics of children, their mothers, and their homes associated with non-adherence.

We analysed data collected in 2015 for 3063 mothers in the 1973–1978 birth cohort of the Australian Longitudinal Study on Women's Health (age, 37–42 years),² and data collected in 2016–17 for their 5780 children in the Mothers and their Children's Health (MatCH) study.³ Human research ethics committees at the Universities of Newcastle (references, H-076-0795, H-2014-0246) and Queensland (references, 2004000224, 2014001213) approved both studies; all mothers provided informed consent.

In the MatCH study, mothers were asked: "Over the past month, about how much screen time has your child had per day on weekdays and weekends?"; the mean time (to the nearest 15 minutes) was recorded. Screen time was defined as time spent watching or using any screen-based equipment, including televisions, computers, tablets, mobile phones, and electronic games. Mothers reported school- and non-school-related screen time; we analysed adherence to recommendations for non-school screen time, separately for weekdays and weekends. Associations between the demographic, health, and household characteristics of children and their mothers and non-adherence were analysed by logistic regression in a generalised estimating equation framework, corrected for clustering of children by mothers (using GENMOD in SAS 9.4 [SAS Institute]). Factors associated with the outcome ($P < 0.05$) in univariable regression were included in the multivariable model (but only one of any highly correlated exposure variable pairs).

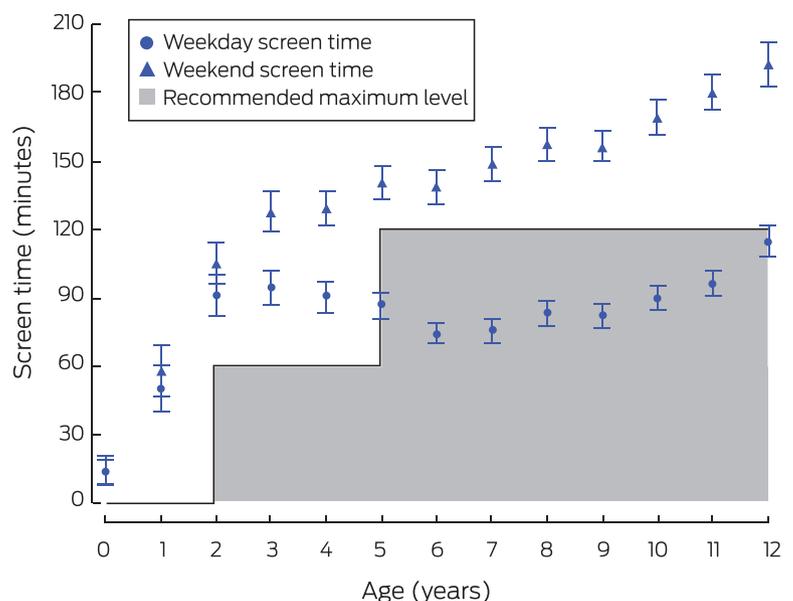
At 12 months of age, mean daily screen time was 50 min (95% confidence interval [CI], 40–60 min) on weekdays and 58 min (95% CI, 47–69 min) on weekends; by 2 years, it was 91 min (95% CI, 82–100 min) on weekdays and 105 min (95% CI, 96–114 min) on weekends. Mean daily screen time was consistently longer on weekends and steadily increased with age. Weekday daily screen time plateaued at about 3 years of age (mean, 94 min; 95% CI, 87–102 min), and the mean values between 5 and 12 years of age (range, 74–115 min) were below guideline levels, probably because of (pre)school attendance (Box 1). The proportions of children whose daily screen time exceeded the recommended maximum were largest

for children aged 1–4 years, while differences in weekend proportions were less marked (Box 2).

Factors associated with non-adherence in multivariable analyses differed by age group:

- 0–12 months: mother frequently having free time (odds ratio [OR], 4.1; 95% confidence interval [CI], 1.5–11) and increasing child age (OR [per month], 1.2; 95% CI, 1.1–1.4);
- 13–24-months: mother working full-time (full-time *v* part-time: OR, 2.7; 95% CI, 1.1–6.2) or not working (not working *v* part-time: OR, 2.7; 95% CI, 1.3–5.8) and no more than two children living with the mother (*v* 3 or more: one child, OR, 2.6; 95% CI, 1.03–6.7; two children, OR, 2.9; 95% CI, 1.3–6.5);
- 25 months to 4 years: mother with non-university post-school qualifications (*v* university: OR, 1.6; 95% CI, 1.04–2.4), with obesity (*v* healthy/underweight: OR, 1.7; 95% CI, 1.1–2.5), or more than 15 hours/week of passive leisure time (OR, 2.0; 95% CI, 1.3–2.9), increasing child age (per 6 months: OR, 1.09; 95% CI, 1.02–1.18), and older age when books first read to child (per month: OR, 1.05; 95% CI, 1.004–1.11);
- 5–12 years: financial stress (OR, 1.4; 95% CI, 1.1–1.7), more than 15 hours/week of maternal leisure time (OR, 2.1; 95% CI, 1.6–2.7), never or rarely feeling rushed, pressured or busy (*v* frequently: OR, 1.6; 95% CI, 1.1–2.6), only child living with

1 Mean daily non-school-related screen time (with 95% confidence intervals) for children aged 0–12 years, by day of week (weekdays, $N = 5484$) and weekends, $N = 5440$)



2 Numbers and proportions of children whose screen time exceeded the recommended maximum, by age

Age of children	Weekdays	Weekend days
< 12 months	38/132 (29%)	37/132 (28%)
1 year	123/186 (66%)	119/184 (65%)
2 years	124/269 (46%)	155/266 (58%)
3 years	188/353 (53%)	253/349 (72%)
4 years	197/397 (50%)	282/392 (72%)
5 years	82/491 (17%)	196/485 (40%)
6 years	53/527 (10%)	209/529 (39%)
7 years	75/566 (13%)	265/565 (46%)
8 years	84/556 (15%)	282/556 (51%)
9 years	62/552 (11%)	275/546 (50%)
10 years	96/547 (17%)	299/544 (55%)
11 years	104/521 (20%)	311/514 (60%)
12 years	103/387 (26%)	245/378 (65%)

mother (*v* 3 children: OR, 1.6; 95% CI, 1.1–2.4), higher child age (per 6 months: OR, 1.02; 95% CI, 1.001–1.04), being a boy (OR, 1.4; 95% CI, 1.2–1.6), less than 10 min/day daily reading with the child (*v* more than 20 min: OR, 1.4; 95% CI, 1.1–1.9), and

allowing electronic games (OR, 1.7; 95% CI, 1.1–2.6) or devices in the child's bedroom (OR, 1.6; 95% CI, 1.2–2.0) (Supporting Information, tables 1 and 2).

Non-adherence to recommendations for maximum screen time varies with age, and the possibility of under-reporting — the MatCH sample consisted of women with some characteristics associated with better adherence to guidelines (higher levels of education and work force participation)³ — means that it may be greater than we have estimated. The rapid uptake of screens by children before their third birthday is of particular concern because greater screen time increases the risk of poorer developmental outcomes.^{4,5} Excessive screen time on weekends among children of all ages reduces their active play time, with implications for their health. The potential harms of screen use for very young children should be investigated, as should strategies for helping parents manage the screen time of their children from early infancy onwards.

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1 Australian Department of Health. Australia's Physical Activity and Sedentary Behaviour Guidelines and the Australian 24-Hour Movement Guidelines. Updated Apr 2019. <http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines#npa05> (viewed June 2019).

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4 Madigan S, Browne D, Racine N. Association between screen time and children's performance on a developmental screening test. *JAMA Pediatr* 2019; 173: 244–250.

5 Stiglic N, Viner RM. Effects of screen time on the health and well-being of children and adolescents: a systematic review of reviews. *BMJ Open* 2019; 9: e023191. ■

Supporting Information

Additional Supporting Information is included with the online version of this article.