

The Research File



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Canadian preschoolers and their physical activity patterns

The preschool period is very important for cognitive, social and physical development of children, as well as the adoption of a healthy lifestyle, including physical activity. Obesity rates among preschoolers have been increasing, motivating experts to develop recommendations for physical activity levels for this age group. Not much is known about physical activity levels among Canadian preschoolers.

In 2007, Timmons et al published a literature review on physical activity for preschool children in which they explored how much and what kind of physical activity preschoolers should engage in.¹ In their review they recommended that preschoolers should engage in physical activities that they find fun and natural, and the role that adults can have increase a child's engagement in physical activity through prompts and by modeling. Additionally, a supportive environment is important—ranging from characteristics of play spaces, outdoor equipment, season, diet and time spent in sedentary behaviour.¹



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In their study, Obeid et al evaluated physical activity levels in a group of Ontario children using high-frequency accelerometry to establish their step counts and activity levels.² They also explored the association between physical activity and step counts; verified the impact of epoch length (accelerometry time sampling intervals) on physical activity; and compared their findings to the current physical activity recommendations for this age group.²

The study data from 30 children ages 3 to 5 (10 girls and 20 boys) were gathered. The researchers collected data about their height and weight to calculate study participants' BMI. Furthermore, children were wearing accelerometers to measure their step count and acceleration in a vertical plane. The data obtained with accelerometers were analyzed to define total wear time, time spent in vigorous physical activity (VPA), time spent in moderate-to-vigorous physical activity (MVPA), moderate physical activity (MPA) and light physical activity (LPA). Comparison by time of the day, day of the week and sex were then completed. Additionally, the physical activity intensity was assessed using different epochs (3-, 15-, 30-, and 60-s epochs).²

On average, preschoolers spent a total of 219.7±31.9 minutes per day being physically active; 75 minutes being MVPA. Majority of the time they participated in LPA, and the smallest amount of time in VPA. Consecutive time in MVPA and VPA were observed as short periods of time (15 seconds

or less). No difference in the activity appeared between boys and girls, and also between weekends and weekdays. Time of the day appears to be correlated with the physical activity intensity—in the mornings most of the time was spent in LPA; while MVPA was more common in the afternoons.²

The average daily step count for preschoolers in this study was 7529±1539 steps and none of them met the target number of steps set by the earlier guidelines. Daily step counts were correlated with MVPA where preschoolers that had the highest daily step count were also most likely to accumulate the highest amount of minutes of daily MVPA.² A similar association is found between daily step counts and minutes of total daily physical activity.

When evaluating the impact of epoch length, VPA and MVPA were the greatest during short epochs (i.e. 3 seconds) and they decreased with the increase in epoch length. Data obtained from 3 second epochs were compared with Active Healthy Kids Canada 2010 Report Card and National Association for Sports and Physical Education (USA) recommendations of 120 minutes of total physical activity per day (the sum of LPA, MVPA and VPA). All the preschoolers in the study met these recommendations.² They also spent at least 60 minutes daily in MVPA which has been correlated with health benefits for school age youth according to Janssen and Leblanc (2010).^{2,3}

The main limitation of this study is

its low sample size; however the study results give us an indication of physical activity levels. It is assumed that preschoolers spend enough time engaging in physical activity, yet not enough research has been done in this population.²

To view the Canadian Physical Activity Guidelines for the Early Years information sheet, please click here.

To view the Canadian Sedentary Behaviour Guidelines for the Early Years information sheet, please click here.

References

1. Timmons BW, Naylor PJ, Pfeiffer KA. Physical activity for preschool children-how much and how? *Can J Public Health.* 2007; 98 Suppl 2:S122-34. Review.
2. Obeid J, Nguyen T, Gabel L, Timmons BW. Physical activity in Ontario preschoolers: prevalence and measurement issues. *Appl Physiol Nutr Metab.* 2011 Apr; 36(2):291-7.
3. Janssen, I., and Leblanc, A.G. 2010. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *Int. J. Behav. Nutr. Phys. Act.* 7(1): 40. doi:10.1186/1479-5868-7-40. PMID: 20459784.

What have we learned?

- Canadian preschoolers spend a total of 219.7±31.9 minutes per day being physically active meeting Active Healthy Kids Canada 2010 Report Card recommendations of 120 minutes of daily physical activity (LPA, MVPA, VPA).
- The average daily step count was 7529±1539 steps.
- Preschoolers with the highest daily step counts were most likely to accumulate the highest amount of minutes of daily MVPA.
- Similarly, preschoolers with the highest daily step counts were more likely to spend more time engaging in daily physical activity.
- Canadian preschoolers gathered at least 60 minutes of daily MVPA which is associated with health benefits.