

Children and adolescents' physical activity during the 'critical window'

Findings from the CLAN study

For young people, the time between the end of the school day and 6pm appears to be an important period for participation in physical activity and is often referred to as the 'critical window'^{1,2,3}. Initiatives that focus on this time period are therefore likely to be important in terms of promoting physical activity amongst children and adolescents.

This study sought to achieve greater understanding of the nature of children's activity during the critical window and the factors influencing it, in order to inform future promotional efforts. In particular, the study examined relationships between the family environment and physical activity during this period.

Study design and methods

The study was a longitudinal design involving parents and children in metropolitan Melbourne over a five year period from 2001 to 2006. In 2001, 1,196 parents were surveyed regarding their family demographics, their own participation in physical activity, family-based activities, and social support and reinforcement of their child's physical activity.

Physical activity of children participating in the study was objectively measured using accelerometers, which enabled estimation of the amount of activity and the intensity of the activity at different times of the day. These measurements were made over an eight day period in 2001, and again in 2004 and 2006. In 2001, the participants were primary school children in grade prep (age 5-6 years) and in grades 5-6 (age 10-12 years).

How important is the 'critical window'?

Findings of the study confirm the importance of this period for children's physical activity. Specifically it found that the critical window period accounted for approximately 25% of total daily time spent in moderate-to vigorous-intensity physical activity (MVPA) across all age groups and sexes for the five years.

The time spent in MVPA during the critical window also made an important contribution to children and youth meeting the recommended guidelines of 60 minutes of MVPA per day.

During the time period between the end of school and 6pm (the 'critical window'), children in the study performed 25% of their total daily physical activity.

Reflecting the overall decrease in physical activity commonly observed as children get older, the younger age group spent almost twice the amount of time in MVPA during the critical window than the older age group.

Of particular concern was the finding that the amount of time engaged in MVPA during the critical window declined by over 50% over the five years of the study. This decline was observed for both the younger (from 60 to 30 mins/day) and older (from 30 to 15 mins/day) age groups.

Jenny Veitch

Verity Cleland

Jo Salmon

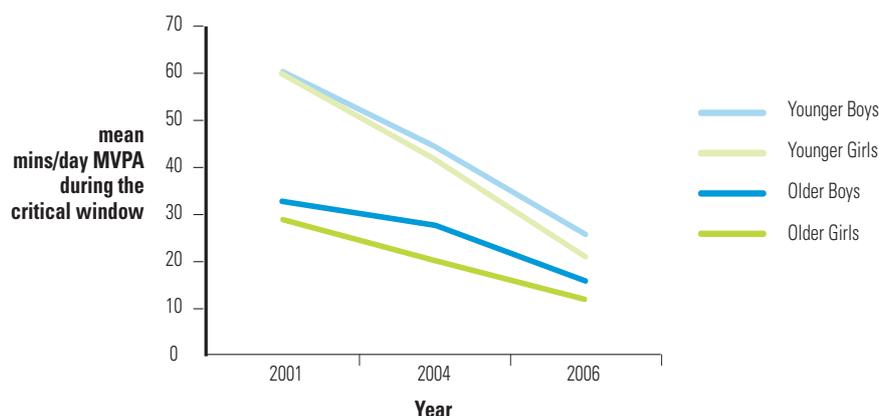
Clare Hume

Anna Timperio

David Crawford

Children and adolescents' physical activity during the 'critical window'

Mean minutes per day spent in MVPA during the critical window



These declines are consistent with previous research examining overall physical activity patterns^{4,5} and highlight the need for strategies to encourage and assist children and youth to continue participation in physical activity as they get older.

What is the impact of the family environment?

Aspects of the family environment were found to influence participation in physical activity during the critical window. In particular:

- boys whose mothers were active tended to be more physically active themselves than boys whose mothers were not as active;
- boys whose fathers praised their participation in physical activity were more likely to be active than boys whose fathers did not praise their participation in physical activity; and
- girls whose mothers participated in physical activity with them were more likely to be active than girls whose mothers did not participate in physical activity with them.

Where to from here?

The findings highlight the importance of the critical window as an opportunity for increasing physical activity amongst children and adolescents.

They also point to a number of strategies that may be useful in promoting children's levels of activity during this period. Role modeling, positive reinforcement and parent co-participation seem particularly influential.

Thus, targeting physical activity of other family members may have important benefits for the health of young people as well as adults. Encouraging fathers to praise their sons' involvement in physical activity may also be an important strategy to consider for future programs and research. And for girls, providing opportunities for them to be active with another family member may be beneficial.

These practical strategies may be readily incorporated into programs at a range of levels, including schools and wider community education.

References

1. Tudor-Locke, C., Lee, S.M., Morgan, C.F., Beighle, A., Pangrazi, R.P. Children's pedometer-determined physical activity during the segmented school day. *Medicine and Science in Sports and Exercise*. 2006;38(10):1732-8.
2. Cox, M., Schofield, G., Greasley, N., Kolt, G.S. Pedometer steps in primary school-aged children: a comparison of school-based and out-of-school activity. *Journal of Science and Medicine in Sport*. 2006;9(1-2):91-7.
3. Mota, J., Santos, P., Guerra, S., Ribeiro, J.C., Duarte, J.A. Patterns of daily physical activity during school days in children and adolescents. *American Journal of Human Biology*. 2003;15(4):547-53.
4. Sallis, J.F. Age-related decline in physical activity: a synthesis of human and animal studies. *Medicine and Science in Sports and Exercise*. 2000;32(9):1598-600.
5. Nader, P.R., O'Brien, M., Houts, R., Bradley, R., Belsky, J., Crosnoe, R., Friedman, S., Mei, Z., Susman, E.J. Identifying risk for obesity in early childhood. *Pediatrics*. 2006;118(3):e594-601.

Acknowledgements

C-PAN gratefully acknowledges the funding provided by the National Health and Medical Research Council to conduct this project, and the support of the Victorian Health Promotion Foundation. Particular thanks goes to all participants in the study.

Contact details for further information:

Dr Jenny Veitch
Centre for Physical Activity and
Nutrition Research
Deakin University
Email: jenny.veitch@deakin.edu.au
www.deakin.edu.au/cpan