Introduction

Early childhood has been identified as a critical time in the development of sedentary behaviours as data shows that these behaviours track strongly into childhood and adolescence. Some sedentary behaviours are important for healthy child development (e.g., play-based activities). These are not the focus of this review. This review is more concerned with sedentary behaviours such as television viewing and other electronic media use as this is where most of the evidence exists. It is also important to note that sedentary behaviour is not the opposite of physical activity; that is, just because a child is physically active does not mean he/she does not spend excessive time in sedentary behaviours.

To determine if an evidence base exists for which to construct sedentary behaviour recommendations for young children (defined in this context as 0-5 years of age), it is important to review the evidence to ascertain if there are any health consequences associated with sedentary behaviour in this age group and if so, is there a “dose” of sedentary behaviour above which these health consequences become more pronounced?

Subject and Research Context

Sedentary behaviour is defined as behaviours that encompass sitting or lying as the dominant posture and result in very low levels of energy expenditure. They are multi-faceted and include screen time (television, DVD, computer), motorized transportation, and sitting to read or complete homework. The majority of sedentary behaviour research in young children has focused on television viewing. While this is an important sedentary behaviour, it is only one of a range that can be undertaken. It is becoming increasingly clear that it is the total time spent in sedentary behaviour, and the length and number of the bouts spent being sedentary, that are important risk factors for health in adults and adolescents. As such, it is important to examine the health evidence for this behaviour in early childhood and determine if there is enough evidence or consensus to make
recommendations for parents, service planners and providers and policy makers within the early childhood sector.

**Problems and Key Research Questions**

Up to the end of 2010, Australia was the only known country to have evidence-based national recommendations for sedentary behaviour for children aged 0 to 5. However, Canada and the United Kingdom are currently developing similar recommendations. A number of recommendations endorsed by bodies such as the American Academy of Pediatrics exist, however, these are based on expert consensus rather than scientific evidence. The aim of this chapter is to summarize the evidence to provide the best possible basis to devise sedentary behaviour recommendations for children aged 0 to 5 years.

The key research questions addressed in this chapter are:

1. Is there any evidence that sedentary behaviour is associated with health and developmental outcomes in early childhood?
2. Based on the evidence, how much time should young children spend in specific sedentary behaviours?
3. Do these recommendations differ for different stages of early childhood (infants, toddlers, and preschoolers)?

**Recent Research Results**

Strong evidence from at least 10 cross-sectional studies show that time spent in sedentary behaviour is positively and significantly associated with body fatness. Two studies reported that preschoolers who spent more than two hours per day watching television had a greater likelihood of being overweight as children. With regards to respiratory health, it has been shown in one longitudinal study that children who watched more than two hours of television per day at 3 years of age were nearly two times more likely to develop asthma by age 11. Conversely, children who watched less than two hours per day at this age had better skeletal health at age seven compared with those who watched more than two hours per day. Cross-sectional evidence has found that time spent watching television was associated with a greater intake of high-energy foods. Four longitudinal studies have reported a positive relationship between time spent watching television under the age of five and lower cognitive development, academic achievement, language skills, and short-term memory one to three years later. Further, three cross-sectional studies found an inverse relationship between television time and language development. Finally, time spent watching television at ages 1 and 3 has been shown to significantly predict attention problems at age 7.

Based on the evidence provided, and consensus among experts, the following sedentary behaviour recommendations for early childhood are proposed: (Note: these are consistent with those recently developed in Australia.)

1. Children younger than 2 years of age should not spend any time watching television or using electronic media.
2. For children 2 to 5 years of age, sitting and watching television and the use of other electronic media
Research Gaps

As a result of reviewing the evidence, there are several gaps in the current research that need to be addressed. These are:

- Is the relationship between sedentary behaviour and health mediated by other associated health behaviours such as an increase in energy intake as a result of increased snacking and exposure to food advertising?
- Does sedentary behaviour displace physical activity?
- Is the relationship between sedentary behaviour and fatness mediated by participation in moderate-to-vigorous intensity physical activity? Since none of the studies reviewed here controlled for physical activity, and these are independent behaviours not necessarily inversely correlated with each other, it is not known if the relationships that have been found between sedentary behaviour and some of the outcomes are a result of higher levels of sedentary behaviour or lower levels of physical activity or both.
- It is not possible to determine if the amount of time spent sitting watching television or the content of the programs viewed is what explains the relationship between television viewing and some cognitive and self-regulation outcomes.

In addition:

- More high quality evidence from experimental and longitudinal studies which have a measure of sedentary behaviour during early childhood is needed.
- More studies that use an objective measure of sedentary behaviour such as accelerometry or inclinometry are needed when examining overall time spent in sedentary behaviour or sitting.
- Most of the evidence is for television viewing. More evidence is needed on the relationship of other sedentary behaviours, especially electronic media use, with health and developmental outcomes.
- Better understanding of the maximum amount of time that young children can spend in total sedentary time and in specific sedentary behaviors (such as watching television and other screen-based activities) before the prevalence of health consequences and adverse developmental outcomes increases.

Conclusions

For children aged 2 to 5 years, spending more than two hours per day watching television or using other electronic media may be detrimental to a wide range of health, developmental and educational outcomes. The evidence is strongest for poorer cognitive outcomes and higher body fatness. This latter point is important given the high prevalence of overweight and obesity among pre-school children, especially in developed countries. As time spent in sedentary behaviour (especially screen time) increases as young children transition into formal
schooling and throughout childhood and adolescence, it is important to minimize time spent in these behaviours prior to school to maximize compliance with the recommendations for school-aged children of no more than two hours of screen time per day. For children under two, there is no evidence that watching television or using electronic media has educational or health benefits; moreover, there is some evidence that it may delay or reduce some cognitive outcomes such as language and word vocabulary. Children aged 0-5 should not be sedentary for more than one hour at a time, except while sleeping. This includes any situation where the child is predominantly inactive (that is, not standing up or moving).

Implications for Parents, Services and Policy

To assist parents, service providers and policy makers in meeting the recommendations around television and other electronic media, it is advised to not have televisions or game consoles in children’s bedrooms or child care centres, not eat meals in front of the television, and to turn the television off when it is not being watched. Parents and service providers should also set limits and rules for their own viewing as well as for children to role model correct behaviours to children.

To help with meeting the recommendation around not being sedentary for more than an hour at a time, try to break up long car trips by stopping at a park or playground for 10-15 minutes. Also try to get children to walk short distances rather than sit in a pram or stroller or alternate walking and sitting for longer journeys.

References


