

Child Outcomes

Maintaining a healthy body weight: risk factors for overweight and obesity in Victorian children

Issue 4 – August 2010



Introduction

Childhood overweight and obesity is a growing problem in Australia with significant implications for current and future health.

This bulletin draws on findings from the 2009 and 2006 Victorian Child Health and Wellbeing Surveys (VCHWS) to report on the occurrence of known risk factors for overweight and obesity among Victorian children.

The Victorian Child Health and Wellbeing Survey (VCHWS) is a computer assisted telephone interview (CATI) survey of parents or carers of 5000 randomly selected children under 13 years of age. The survey is repeated every three years.

VCHWS forms part of a rolling program of data collections, within the Victorian Child and Adolescent Monitoring System (VCAMS), discussed in Bulletins 1 and 2, see: <http://www.education.vic.gov.au/about/directions/children/vcams/default.htm>

Global and national trends in childhood overweight and obesity

The epidemic of childhood overweight and obesity is a major global public health crisis,

particularly in economically developed countries, and in urbanized populations (Wang and Lobstein 2006). In Australia, between 1985 and 1997, the prevalence of overweight doubled and obesity tripled among children aged seven to 15 years (Booth, et al. 2003). The rate of childhood overweight and obesity has also continued to rise with an additional 1% of all Australian children becoming overweight each year (Booth et al. 2006).

While the prevalence of overweight for Australian children is less than in some developed nations, such as the USA, the rate of rise is among the steepest (Lobstein et al. 2004). The 2007 Australian National Children's Nutrition and Physical Activity Survey found that 17% of children (aged 2-16 years) were overweight and 6% were obese ¹ (Commonwealth of Australia 2008).

Impacts and risk factors

Evidence shows that childhood overweight and obesity is associated with an increased risk of physical problems developing before or during early adulthood, including chronic disease. Physical consequences including insulin resistance / impaired glucose tolerance, hypertension, and a fatty liver are precursors for Type 2

diabetes, cardiovascular and liver disease (Lobstein et al. 2004).

While the impact of obesity on physical health is well established, the most pervasive effects may be psychosocial (Dietz 1998). Social isolation, discrimination, bullying and peer problems can accompany childhood obesity (Strauss 2000) and lower self esteem combined with increased rates of sadness, loneliness and nervousness, has been reported in obese adolescents (Dietz 1998; Strauss 2000). Obese children and adolescents are at risk for psychological and social adjustment problems, including lower perceived capabilities in social and athletic skills, and dissatisfaction with physical appearance (Dietz 1998).

Evidence suggests that obese children are also likely to progress into obese adults. ² Obesity and overweight has direct financial costs associated with an increase in treatment services for related complications. In 2005, the total cost of obesity in Australia, not including overweight, was estimated at \$21 billion (Diabetes Australia 2006).

Known risk factors for childhood overweight and obesity include over-nutrition, especially of energy-dense foods and sweetened drinks, low levels of physical activity and an increase in sedentary activities.

¹ Overweight and obesity data are collected using body mass index (BMI); a person's weight divided by the square of their height in metres.

² Evidence indicates that the persistence of obesity into adulthood relates to the severity of the obesity and the childhood age at which it is present (Must and Strauss, 1999)

However, attempting to modify these risks is complex as they are influenced by a range of factors. Family plays a major role, for example, in influencing children's meal habits and physical activity (Green et al. 2003, Reilly, 2005). Physical activity levels are also influenced by other environmental and societal factors, such as changes in mode of transport, increasing urbanisation (WHO 2000) and increasing concerns about child safety and injury risk.

In addition, there is evidence to suggest that some Australian children are more at risk of being overweight and obese. These include Indigenous children (Wake et al. 2006), those socially and economically disadvantaged (Wake et al. 2006, Sanigorski et al. 2008), and/ or children from culturally and linguistically diverse backgrounds (Renzaho et al, 2006, Wake et al. 2006).

VCHWS methods and findings

The 2009 VCHWS collected information on a range of child health and wellbeing outcomes for children aged less than 13 years. Using a standard random selection method to select households across metropolitan and rural Victoria, the survey was administered to parents/guardians over the telephone. Information about one child per household was collected. In 2009 the response rate was high, with 75 per cent of eligible contacted households completing the survey.

Nutrition

Fruit and vegetables are a significant source of vitamins and minerals that play an important protective role in many diseases. They are also a good source of dietary fibre, complex carbohydrates and folic acid (DHS, 2007). An increased consumption of fruit and vegetables is likely to result in a corresponding decrease in fat intake (NSW Department of

Table 1: Recommended daily intake of fruit and vegetables

| Consumption | Age group | Recommended serves |
|-------------|-------------|--------------------|
| Fruit | 4-7 years | 1 serve |
| | 8-11 years | 1 serve |
| | 12-18 years | 3 serves |
| Vegetables | 4-7 years | 2 serves |
| | 8-11 years | 3 serves |
| | 12-18 years | 4 serves |

Source: NHMRC (2003)

Health 2002). National Health and Medical Research Council (NHMRC) recommendations for fruit and vegetable intake, for children and young people aged 4 to 18 years, are shown (Table 1).³

The 2009 VCHWS shows that among Victorian children aged between 4 and 12 years, the majority (89.2%) meet the NHMRC recommended daily intake for servings of fruit.⁴ There are marked differences in consumption by age with only 26.3% of 12-year-olds meeting this target, compared with more than 94% in the younger age cohorts (aged 4-7 years and 8-11 years).

Vegetable consumption is much lower overall, with only 37.6% of children consuming the recommended daily servings of vegetables.⁵ Only 34.7% of children aged 4-12 years meet both the NHMRC targets for fruit and vegetables.

Soft drinks, cordial, sports drinks, and fruit juices (referred to as 'sugary drinks') contain large amounts of sugar, and consumption of these beverages often displaces healthier options such as milk and water. Excessive consumption of soft drinks has been linked to childhood obesity (Ludwig et al. 2001), and an increased risk of dental caries (Watt et al. 2000). Among Victorian children aged 1-12 years, 44.4% of children drink, on average, 1.8 standard cups of sugary drinks per day, while 55.4% rarely or never consume sugary drinks daily.

However, comparison with the 2006 VCHWS suggests an overall decrease in consumption of sugary drinks

with 58.5% of children (in 2006) drinking, on average, 2.1 standard cups of sugary drink per day and 41.5% of children rarely or never consuming a sugary drink.

54% of children in households with an income under \$40,000 (LCI 50%; UCI 58.3%)⁶ drink at least one cup of 'sugary drink' per day, compared with 42.3% of children in households with an income of more than \$40,000 (40.3 - 44.3%).

Hot-chips, fries, crisps, hamburgers, and fast/takeaway foods often contain large amounts of fat. A high fat diet contributes to overweight and obesity and has been linked to the development of Type 2 diabetes and cardiovascular disease (Lobstein et al. 2004).

Among Victorian children aged 1 to 12 years, 8.4% consume fries/chips/wedges more than four times a week; and 6.9% have takeaway meals five times a month or more. Older children (aged 9 to 12 years) consume more high-energy dense foods than younger children.

8.9% of children in households with an income under \$40,000 (6.4 - 11.4%) consume six or more serves of fries per week, compared with 4.6% of children in households with an income of more than \$40,000 (3.8 - 5.4%).

Children who consume less than eight servings of fries per month are more likely to meet both the NHMRC fruit and vegetable targets than children who consume eight or more servings of fries per month.^{7 8}

³ In 2009 nutrition and physical activity recommendations for children under the age of 5 years were released by the Commonwealth in 'Get Up & Grow' (DoHA 2009).

⁴ A serve of fruit is one medium piece or two small pieces of fruit, or one cup of diced pieces (NHMRC, 2003).

⁵ A serve of vegetables is half a cup of cooked vegetables or one cup of salad vegetables (NHMRC, 2003).

⁶ There is a 95 per cent probability that the true value lies between the lower and upper limits of the confidence interval.

⁷ 'Fries' includes French fries, chips, wedges, fried potatoes and crisps. 37.5% of children who consume less than eight servings of fries per month (35.1 - 40.0%) meet both the fruit and vegetable targets, compared with 29.9% of children who consume eight or more serves of fries per month (26.8 - 33.0%).

⁸ This finding should be interpreted with caution as all kinds of vegetables, including potatoes, are included in the measurement of vegetable consumption. Vegetables can be cooked or raw, fresh, tinned or frozen.

Physical activity

An active lifestyle during childhood will assist in establishing activity patterns likely to continue into adulthood, and reduce the risk of developing Type 2 diabetes and cardiovascular disease. Current Australian recommendations for children aged 5 to 12 years are at least 60 minutes of moderate to vigorous physical activity everyday (DoHA, 2004).

In the 2009 VCHWS 60.3% of children aged 5 to 12 years are physically active for at least 60 minutes everyday (58.2 - 62.4%). Males are more likely than females to participate in the recommended level of physical activity; and children who meet both the NHMRC fruit and vegetable targets are more likely, than children who meet neither of these targets, to meet the physical activity target (Figure 1). ⁹

The proportion of children participating in the recommended amount of physical activity declines with age. 68.7 % of 5-8 year-olds do the recommended amount every day (65.9 - 71.5%); compared with 52.2% (49.2 –55.2%) of 9-12 year olds.

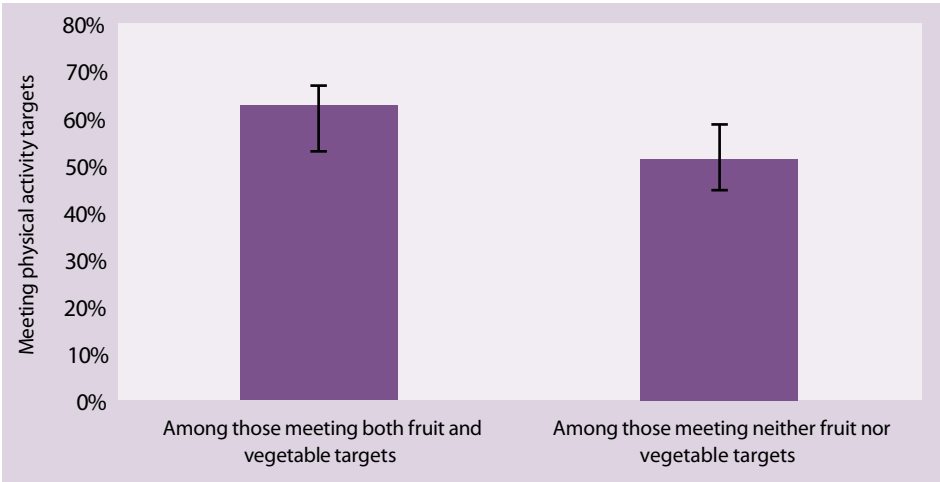
There is a marked drop off in participation in recommended levels of physical activity, between the ages of 8 and 9 years ¹⁰ (Figure 2).

Comparison with the 2006 VCHWS suggests that there has been a decrease, between the two surveys, in the proportion of children aged 5-12 years who meet the recommended level of physical activity (from 71.2% to 60.3%). The decrease is greatest among children aged 9-12 years (Table 2).

One way in which children can get regular physical activity is through walking or cycling to school . However, there have been marked increases, since the mid 1970s, in the proportion of trips to school by car (DEECD 2009).

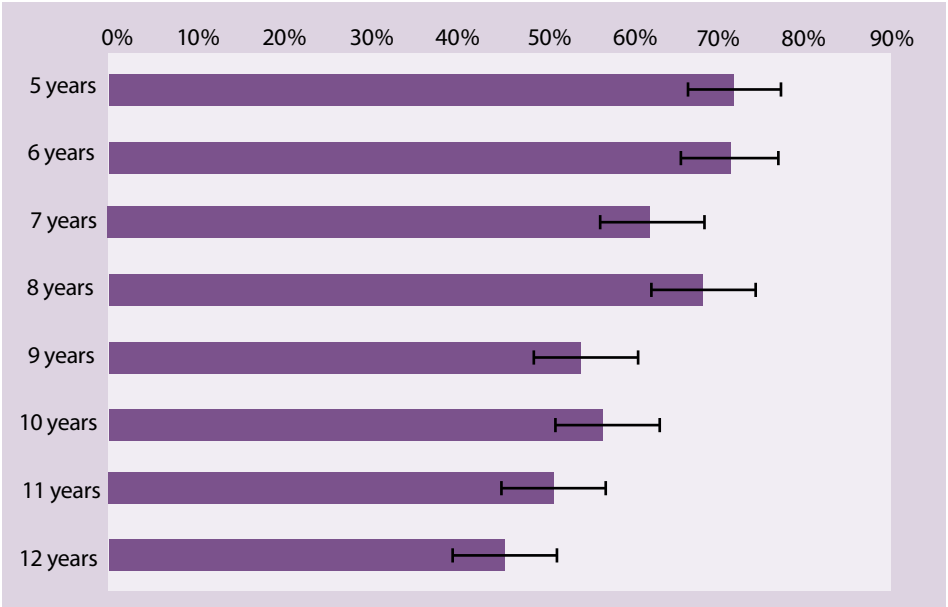
The 2009 VCHWS shows that nearly half (49.8%) of Victorian children aged 4 to 12 years make all their trips to school by car, while just 10.2% make all their school trips on foot. Older children (aged 10-12 years) are less likely, than younger children (aged 4-6 and 7-9 years), to make all their trips by car, although 38.6% still do so (Table 3).

Figure 1: Relationship between meeting fruit and vegetable targets and meeting the physical activity target, children aged 5-12 years



Source: Victorian Child Health and Wellbeing Survey 2009

Figure 2: Proportion of children aged 5-12 years participating in recommended level of physical activity



Source: Victorian Child Health and Wellbeing Survey 2009

Table 2: Proportion of children, by age group, meeting recommended level of physical activity, 2006 and 2009

| Age in years | 2006 (%) | 2006 (%) |
|------------------|--------------------|--------------------|
| 5-8 years | 75.1 (72.3 – 77.9) | 71.2 (69.2 – 73.1) |
| 9-12 years | 67.4 (64.6 – 70.2) | 52.2 (49.2 – 55.2) |
| All (5-12 years) | 71.2 (69.2 – 73.1) | 60.3 (58.2 – 62.4) |

Source: Victorian Child Health and Wellbeing Survey 2009

Table 3: Proportion of children, by age-group, making all trips to school by car and on foot

| Age in years | All trips to school by car (%) | All trips to school on foot (%) |
|--------------|--------------------------------|---------------------------------|
| 4-6 | 59.4 (55.2 – 63.5) | 9.7 (7.0 – 12.3) |
| 7-9 | 54.7 (51.1 – 58.2) | 9.9 (7.6 – 12.1) |
| 10-12 | 38.6 (35.2 – 42.0) | 10.9 (8.6 – 13.2) |
| 4-12 | 49.8 (47.7 – 52.0) | 10.2 (8.8 – 11.6) |

Source: Victorian Child Health and Wellbeing Survey 2009

⁹ Among children who meet both the fruit and vegetable targets, 63.3% meet the physical activity target (59.6 – 67.0%). Among children who meet neither of these targets, 51.7% meet the physical activity target (44.7 – 58.7%).

¹⁰ 68.4% of children aged 8 years (62.5 – 74.2%) participate in recommended physical activity levels, compared with 54.6% of children aged 9 years (48.4 – 60.7%).

While distance from school clearly influences children's mode of transport, among children who live less than 2 kilometres from school, 38% always travel by car and 18.4% always walk.¹¹

Comparison with the 2006 VCHWS shows no significant change in children's mode of transport to school between 2006 and 2009.

Time spent engaged in sedentary pursuits is time that could otherwise be spent in physical activity. Television viewing of more than 2 hours a day in childhood and adolescence is associated with poor fitness, smoking, raised cholesterol and being overweight in adulthood.

The Department of Health and Ageing Guidelines recommend that children and young people should not spend more than 2 hours a day using electronic media for entertainment (e.g. computer games, Internet, TV), particularly during daylight hours (DoHA, 2004).

Among Victorian children aged 5 to 12 years, 18.8% of children (17.2 - 20.4%) spent more than 2 hours a day using electronic media. Males and older children were more likely (than females and younger children) to exceed the guidelines.^{12 13}

Discussion

Findings presented in this bulletin suggest that Victorian children demonstrate a number of risk factors for overweight and obesity. These VCHWS findings are broadly similar, although not directly comparable, to those reported in the National Children's Nutrition and Physical Activity Survey (Commonwealth of Australia 2008).¹⁴

While Victorian children are more likely to meet the requirements for fruit, than vegetable, consumption, the low level of vegetable consumption is concerning, and not only in the context of poor nutrition. If children are not eating vegetables then

they are likely to be substituting with other foods such as those high in energy and fat. A high energy- and fat- dense diet is known to increase the risk of a child becoming overweight and obese.

The survey findings highlight that there are clear relationships between children's health-promoting behaviours and lifestyles, so that children who consume less fries are more likely (than children who consume more fries) to meet NHMRC targets for fruit and vegetable consumption; and children who meet the targets for fruit and vegetable consumption are more likely, than children who meet neither of these targets, to meet the DoHA physical activity target.

Age is also an important factor in children's health-related behaviour, with older children being less likely (than younger children) to meet fruit and vegetable targets and more likely to exceed guidelines for the use of electronic media. Older children are also less likely than younger children to engage in recommended physical activity levels; and in the light of this, it is of some concern that the greatest decrease in the proportion of children meeting recommended levels (2006 to 2009) is among the older age group (9-12 years).

It is possible that these age-related differences in the proportion of children meeting physical activity targets are linked to an age-related decline in active play and organised sport rather than to changes in mode of transport to school (see also: Centre for Physical Activity and Nutrition Research 2007). There was no significant change between the 2006 and 2009 VCHWS in other factors that may influence physical activity levels, such as the proportion of children walking to school and amount of time spent using electronic media.

On a much more positive note, consumption by Victorian children of sugary drinks has decreased between the 2006 and 2009 surveys. Also, the 2009 survey found little evidence of a relationship between low household income and the range of risk factors for

obesity and overweight. While children from low income households (< \$40,000) were more likely to drink more than one cup of sugary drink per day and to consume six or more serves of fries per week, there was no significant relationship between household income and fruit and vegetable consumption or between household income and physical activity.

Conclusion

The two waves of the Victorian Child Health and Wellbeing Survey (VCHWS) have provided an opportunity to report on the occurrence of some known risk factors for overweight and obesity among Victorian children aged less than 13 years. This information can be used to inform further research and appropriate and effective policy and practice.

An understanding of the relationships between risk factors is important in the design of effective interventions to address this issue. Specific interventions to address childhood overweight and obesity will also be most effective if they are planned and developed on the basis of sound evidence about 'what works'. The Victorian Government has developed a catalogue of evidence-based strategies which provides program planners with a range of early childhood and adolescent intervention strategies that are known to be effective in improving outcomes for children. This catalogue, which is regularly expanded and updated with new research, can be viewed and searched at:

www.education.vic.gov.au/about/directions/children/intervention.htm

Relevant evidence summaries are also available at:

www.health.vic.gov.au/healthpromotion/evidence_evaluation/cdp_effectiveness.htm

¹¹ Factors influencing whether children actively commute to school include social networks and the physical environment of the local neighbourhood (Centre for Physical Activity and Nutrition Research, 2007).

¹² 21.3% of males (18.9 - 23.6%) spent more than 2 hours a day using electronic media, compared with 16.1% of females (14.0 - 18.3%).

¹³ 23.8% of 9-12 year-olds (21.4 - 26.3%) exceeded the guidelines, compared with 13.6% of 5-8 year-olds (11.5 - 15.6%).

¹⁴ Children in the national survey demonstrated a low level of observance of the NHMRC Dietary Guidelines for Children and Adolescents in Australia (NHMRC 2003). The proportion of children (aged 2-16) who engaged in at least one hour of moderate to vigorous exercise on the day surveyed was 69%.

Childhood overweight and obesity: key policy directions

State Public Health and Wellbeing Plan

The Public Health and Wellbeing Act (2008) provides a legislative base for Victoria's preventive health effort. The Act declares the responsibility of the state in promoting and protecting the public health and wellbeing of Victorians. The Act recognises that the determinants of health are broad and that to prevent disease, illness, injury, disability or premature death requires a comprehensive approach which tackles these determinants. A State Public Health and Wellbeing plan is to be produced every 4 years as a requirement of the Act, which details the developments and activities that will be undertaken to protect the public health and wellbeing of Victorians.

National Partnership Agreement on Preventive Health

The National Partnership Agreement on Preventive Health targets preventable lifestyle risks that contribute to chronic disease. The Commonwealth Government, States and Territories have agreed to work toward the achievement of performance benchmarks relating to healthy weight, fruit and vegetable consumption, physical activity rates in children and adults, and adult smoking rates through a healthy behaviours approach in childhood

services, schools, workplaces and communities.

School Curriculum

The Health and Physical Education domain of the Victorian Essential Learning Standards guides teachers to provide students with the knowledge, skills and behaviours for lifelong involvement in physical activity, health and well being.

Physical education and sport education are mandated in Years P-10 in Victorian government schools with minimum time allocations for all students.

Go for your life

The Victorian Government's 'Go for your life' Strategy includes a number of policies and programs across government to address children's healthy eating and physical activity.

Current programs within this initiative include: Kids- 'Go for your life', 'Go for your life' Canteens Advisory Service, 'Go for your life' Kitchen Garden Project, 'Go for your life' Free Fruit Friday, Ride2School and 'Go for your life' Obesity Prevention Projects.

For further information see:
www.goforyourlife.vic.gov.au
www.education.vic.gov.au/about/directions/goforyourlife.htm

www.diabetesaustralia.com.au/_lib/doc_pdf/reports/obesity/Economic_Costs_of_Obesity_Exec_Summ.pdf (accessed 8 Jan 2008).

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