



Eating Behaviours in Childhood: Why they Matter and What Can We Do?

KEY POINTS:

- Childhood obesity is a public health concern, and the risk of developing an unhealthy body weight during childhood is greater for children with eating behaviours that facilitate food intake.
- Larger portions, faster eating rate, and consuming food when no longer hungry are common eating behaviours that can increase overall food intake at meals and promote weight gain.
- Strategies to prevent childhood overweight and obesity in Singapore should target children's eating behaviours early in life and engage children, families, caregivers in infant care centres, preschools and the wider early childhood sector.

Childhood obesity is a public health concern

Childhood obesity has been the focal point of numerous public health initiatives worldwide^{1,2}, and is also a key discussion point in Singapore. The Ministry of Health reports that the prevalence of obesity from ages 6 to 18 years has grown from 11% in 2013 to 13% in 2017³, which follows an upward trend in the average weight of children across past decades (from 1957 to 2002)⁴. This is an important public health concern because childhood overweight and obesity tends to persist into adulthood^{5,6} and is associated with a variety of chronic health conditions, including type 2 diabetes⁷, cardiovascular disease⁸ and poor mental health⁹. Prevention is key to mitigate the downstream physical, social, emotional, and economic impacts of unhealthy weight gain during childhood.

Targeting eating behaviours to modify risk of childhood obesity: Evidence from Singapore

Preventing childhood obesity is a multi-

dimensional challenge. Findings from Singapore's most extensive birth cohort study, Growing Up in Singapore Towards healthy Outcomes (GUSTO)¹⁰, show that some children are at greater risk of becoming overweight than others based on their exposure to risk factors in early life, such as having parents with overweight or obesity or their early introduction of solid foods¹¹. Children exposed to more of these risk factors in the first 1,000 days of life were more likely to be overweight by the time they were four years old¹¹.

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However, not all GUSTO children at risk of becoming overweight went on to develop higher levels of body fat. Higher risk children only developed unhealthy body weight if they also displayed eating behaviours associated with higher calorie intakes during meals¹². This suggests that targeting children's eating behaviours during the preschool period could reduce the impact of a variety of early life familial risk factors associated with developing obesity.

Healthy eating guidelines often provide recommendations for what children should eat, but evidence from the GUSTO study highlights the importance of considering this alongside how children are eating, to better understand the contribution of their eating behaviours to unhealthy weight gain.

Children who ate more in the absence of hunger at 4.5 years old were **three times more likely** to do the same when they were 6 years old.

Evidence has consistently shown that children eat more when served larger portions of food¹³. In Singapore, for example, preschool children (age 2 to 6) ate more during lunch times when teachers served them 50% more food, and increased food intake was more pronounced in older children, who through experiences in the earlier years, had learned to finish everything on their plates¹⁴. In the GUSTO study, children who selected larger portions for their lunch consumed more calories, and portion selections were related to their self-regulation skills—an important set of skills that develops in early childhood¹⁵. In other countries, larger portion sizes have been associated with increased weight gain as early as the first two years of life^{16, 17}.

In addition to portion sizes, evidence from the GUSTO study showed that children's eating speed was also an important determinant of their food intake. Children who ate faster (by taking larger bite sizes and chewing their food less) and for a longer time, consumed significantly more calories at lunch compared to those who ate at a slower speed¹⁸. Consequently, faster eating was associated with higher levels of body fat as early as 4.5 years of age¹⁹, and was linked to parent reports of higher food enjoyment and lower satiety responsivity in children who had the highest BMI for their age²⁰. This supports other evidence suggesting that teaching children to slow down their eating speed is one possible strategy to reduce food intake and promote healthy growth²¹.

Another important contributor to higher energy intakes in GUSTO was snacking in the absence of hunger. Over 70% of children ate palatable snack foods when offered almost immediately after lunch, despite previously reporting that they were no longer hungry²². Children who ate more in the absence of hunger at 4.5 years old were three times more likely to do the same when they were 6 years old²². Importantly, eating in the absence of hunger was linked to greater



calorie consumption overall, highlighting that children who have frequent access to palatable, calorie dense snacks in between meals could be at risk of sustained higher energy intakes, which can facilitate unhealthy weight gain.

Finally, although parents and caregivers play an important role in determining the quality and quantity of children's food provisions, such as access to palatable, calorie dense snacks, their influences on children's eating behaviours also extend to a range of other feeding interactions. For example, GUSTO children who



ate faster and for a longer time were prompted to eat by their mothers more often during the meal²³, and mothers reported more restrictive feeding practices when their child had a higher BMI²⁴. Taken together, evidence suggests that mealtimes are an opportunity for parents to both influence and respond to their child's behaviours and body weight, not just with the foods they provide, but also their verbal cues and prompts. Alongside parents, grandparents, infant care centres, preschools, and other

childcare providers, have an important role to play, collectively shaping a child's early feeding environment through their knowledge, attitudes, and practices^{25, 26}.

Implications for Policy and Service Provision

Understanding how children eat is as important as knowing what they eat. Children who 1) select and consume larger portions, 2) eat faster, and 3) eat in the absence of hunger are more likely to consume more food than children who do not show these behaviours, and consequently, are at greater risk of developing overweight or obesity during the preschool years. Strategies aimed at improving these aspects of children's eating behaviour concurrently, rather than in isolation, are a promising avenue for intervention. Critically, efforts to support the development of food intake regulation skills across multiple behaviours will need to target children in the context of their wider feeding environment. In Singapore, this includes parents and other family members, such as grandparents, as well as childcare providers, teachers, and healthcare professionals²⁵. Hands-on multi-sector interventions, such as school-based cooking and gardening programmes, have reported positive effects on children's food preferences²⁷. Therefore, partnering with healthcare providers and the early childhood sector will be vital to identify, co-develop and implement intervention programmes that are effective, impactful and reach the children and families who need them. The evidence shows that interventions to establish and promote healthy eating behaviours and diets in young children are most effective if these are comprehensive and involve the community at large²⁸.

RECOMMENDATIONS:

- Public health policies tackling childhood obesity should take a holistic view of children's eating behaviours by looking beyond what they eat, to how they eat, how much and when.
- Children should be supported to consume appropriate portion sizes and to eat slower by taking smaller bites and chewing more, and their exposure to palatable, energy dense snacks in between meals should be limited.
- Intervention programmes designed to improve children's eating behaviours will be more effective if they start early and target multiple eating behaviours, rather than single behaviours, and engage children alongside their wider caregiving community, including parents, grandparents, infant and childcare providers as well as preschools.

Multi-sectoral partnerships are encouraged to create **effective obesity prevention strategies** that are wide-reaching and uniquely designed to address the specific needs of children and families in Singapore.



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About CHILD

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