

Review

Nurturing healthy dietary habits among children and youth in Singapore

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Healthy diet is a key tenet in the prevention of many chronic diseases. Nurturing healthy dietary habits is especially important in childhood as this is a critical period of growth and development. Furthermore, dietary habits are shaped from an early age with many of them forming even below the age of 5 years. Therefore, the importance of nurturing healthy dietary habits during a child's formative years cannot be underestimated. Reducing fat, salt and sugar intake and at the same time, advocating the consumption of adequate whole-grains, fruit and vegetables among the population remain the cornerstone of the Singapore Health Promotion Board's (HPB) key nutrition initiatives. To achieve this, HPB adopts a multi-pronged approach comprising various strategies to promote healthy eating among children and youth in Singapore. This article provides an overview of these strategies and the broad range of nutrition education efforts targeted at the young.

Key Words: health, diet, children, youth, health promotion

INTRODUCTION

Healthy diet is a key tenet in the prevention of many chronic diseases. Nurturing healthy dietary habits is especially important in childhood as this is a critical period of growth and development. Furthermore, dietary habits are shaped from an early age with many of them forming even below the age of 5 years;¹ and these habits subsequently become more difficult to change after the age of 11–18 years.² Therefore, the importance of nurturing healthy dietary habits during a child's formative years cannot be underestimated.

A Students' Health Survey³ conducted among Secondary 1 to Secondary 4 students (13–16 years old) in 2006 revealed that only 40% and 46% of the students consumed the daily recommended 2 servings of fruit and vegetables daily respectively. Twenty-nine percent of them consumed sweetened drinks more than once a day and 52% of them consumed deep fried food more than twice a week.

Reducing fat, salt and sugar intake and at the same time, advocating the consumption of adequate whole-grains, fruit and vegetables among the population remain the cornerstone of the Health Promotion Board's (HPB) key nutrition initiatives. To achieve this, HPB adopts a multi-pronged approach comprising various strategies to promote healthy eating among children and youth in Singapore. These include:

- 1) Capacity building and empowerment
- 2) Healthy dietary guidelines
- 3) Supportive health promoting environments
- 4) Stakeholder engagement
- 5) Sustainable collaborations
- 6) Research and evidence-informed practice

- 7) Management of severely overweight children and youth

CAPACITY BUILDING AND EMPOWERMENT

HPB builds the health literacy of children, youth and other relevant stakeholders (e.g. parents, teachers) who play a key role in nurturing the young. Such capacity building efforts aim to equip children and youth with relevant knowledge about healthy nutrition and empower them to make healthier food choices as they grow up. The capacity building and empowerment is carried out through:

a. Face-to-face nutrition education programmes. Depending on the target audience, different engagement approaches are adopted. For example, a wide range of child-centric strategies such as skits that incorporate comedy, magic, music, puppetry and ventriloquism are used to disseminate nutrition education messages in a fun and engaging manner among the pre-schoolers.

Evaluation of such innovative and engaging methods of health education among the young showed that the children increased their knowledge about key nutrition messages. Majority of the pre-school teachers who attended the programmes also agreed that the

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Pre-schoolers learning about healthy eating through an interactive puppet show

children's knowledge about healthy nutrition and awareness of the importance of a well-balanced diet had improved.

For the older primary school children, interactive nutrition education exhibits are set up in schools to reinforce their understanding of healthy nutrition and encourage the adoption of positive dietary habits.



Primary school children learning about healthy nutrition with interactive exhibits displayed in school

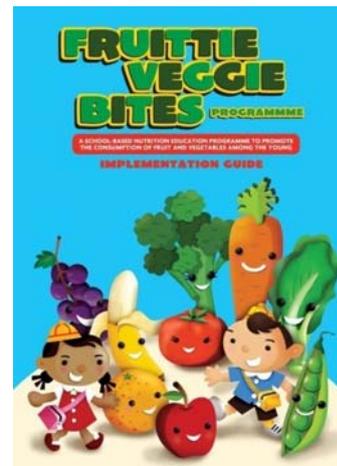
b. Experiential learning programmes. The Fruittie Veggie Bites programme is targeted at primary school students and seeks to raise their awareness about the importance of eating a variety of fruit and vegetables and encourages them to eat the recommended intake of fruit and vegetables every day.

This programme comprises two key components – a rewards scheme and classroom activities. With the rewards scheme, school canteen operators issue students with token cards when the students purchase fruit and vegetables from them. Students collect these cards and the class with the most number of cards will be awarded tokens which bear nutrition education messages.



Fruittie Veggie Bites token cards

To complement the rewards scheme, participating schools are given a resource guide which comprises simple activities for the teachers to reinforce the key nutrition messages about the consumption of fruit and vegetables.



Fruittie Veggie Bites resource guide

About half the students surveyed following the conduct of the programme agreed that they have become more motivated to purchase fruit and vegetables during recess. Many of them also agreed that the reward cards have made it more fun for them to consume fruit and vegetables in school.

For the secondary school youth, other innovative approaches, such as the Healthy Food Race was launched to promote healthy nutrition. Teenage participants took part in a series of nutrition-related tasks at different locations, including eateries and supermarkets, in the neighbourhood. Through this activity, the participants learned to choose healthier food options in their local communities. They were also taught how to prepare healthier dishes.

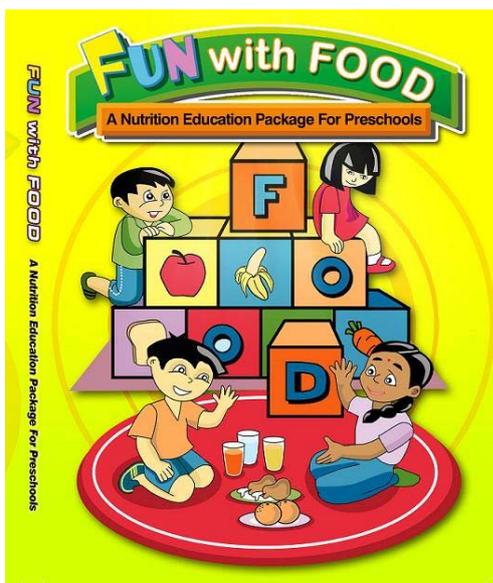
c. Leveraging on information technology. HPB leverages on information technology to engage the Internet-savvy youth in its nutrition education efforts as well. For example, it organised a blog where youth were

encouraged to share their experiences of eating fruit and vegetables and in so doing encourage their peers to do so too. Familiar and popular local personalities (e.g. radio DJs) were also invited to blog about their experience of consuming fruit and vegetables and at the same time serve as positive role models for the youth to emulate.



Blog for the youth to share experiences of eating fruit and vegetables

- d. **Educational resources.** HPB develops a wide range of health education resources including the conventional ones (e.g. pamphlets, booklets) and more youth-centric ones (e.g. post-cards) which cater to different age groups. These resource materials aim to equip various stakeholders with knowledge and skills to adopt healthy dietary practices.
- e. **Incorporation within curriculum.** HPB works closely with the Ministry of Education to incorporate healthy eating messages in the Health Education and Home Economics curricula. It also developed a pre-school nutrition “Fun with Food” education package, complete with lesson plans, educational posters, CD-Roms and games, for pre-school teachers to teach young children about healthy eating.



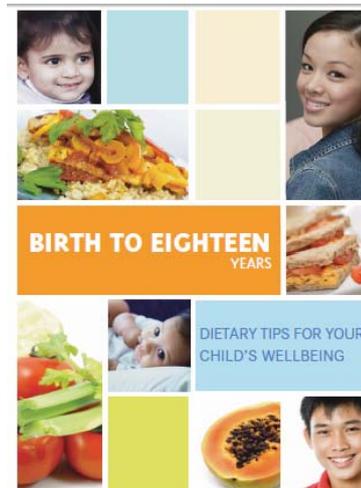
“Fun with Food” Pre-School Education Package

HEALTH DIETARY GUIDELINES

HPB published a set of dietary guidelines for children and adolescents to provide relevant, practical and scientifically based information on how to promote and maintain health and wellbeing through healthy eating. HPB re-



Wide range of health education resources to promote healthy eating



Dietary guidelines for children and adolescents

Table 1. Food service guidelines for the Healthy Eating in Child Care Centres Programme

- 1) Provision of at least 1 glass (250 ml) of milk per day
- 2) Provision of 0.5 - 1 serving of fruit per day
- 3) Provision of 0.5 - 1 serving of vegetables per day
- 4) Limiting the sugar content in sweetened dishes/desserts to no more than 8 g sugar per 100 ml
- 5) Removal of skin from poultry and use of lean cuts of meat
- 6) Limiting processed meats to no more than once a week
- 7) Limiting deep-fried foods to no more than once a week

views and revises these dietary guidelines regularly to ensure that they remain current and relevant.

SUPPORTIVE HEALTH PROMOTING ENVIRONMENTS

Apart from capacity building, it is important to establish supportive environments which promote health for our children and youth. The **Championing Efforts Resulting in Improved School Health (CHERISH)** initiative, modeled after WHO's Health Promoting Schools framework, provides the backdrop against which such environments are put in place in educational settings. The CHERISH initiative provides schools with a guide on how they can put in place appropriate systems, processes and structures to distinguish themselves as settings which promote the health and wellbeing of their students and staff. Schools which demonstrate commendable health promoting efforts will be assessed and accorded a Bronze, Silver, Gold or Platinum Award. This bi-ennial award is jointly administered by HPB and MOE.

To help child and youth-centric settings such as the child care centres and schools institute health promoting environments which foster healthy nutrition, HPB has developed the Healthy Eating in Child Care Centres Programme (HECCP), Healthy Eating in Schools Programme (HESP), Health Promoting School Canteen Programme (HPSC) and the Healthier Canteen Programme.

a. *Healthy Eating in Child Care Centres Programme.*

Children attending child care centres usually consume 2 main meals and 1-2 snacks in the centre every day. As such, it is important for child care centres to provide healthy meals and shape the children's food preferences. Participating child care centres are required to adhere with seven food service guidelines (Table 1) to cut down the amount of fat, sugar and salt in the children's diet and to provide sufficient milk, fruit and vegetables. They are also encouraged to provide nutrition education for their children. These centres are assessed every year and those that pass will qualify for the Healthy Eating in Child Care Centre Award. In 2010, 389 childcare centres participated in the pro-

gramme and 92% of the centres assessed received the Healthy Eating in Child Care Centres Award.

b. *Healthy Eating in Schools Programme.* Most primary and secondary schools in Singapore have up to eight stalls in their canteen serving dishes of different cuisines. The Healthy Eating in Schools Programme provides students and staff with convenient access to healthier food and beverage choices. The programme provides participating schools with a set of healthier food service guidelines (Table 2) which aim to cut down fat, sugar and salt and serve whole-grains, fruit and vegetables in the meals. All participating schools are assessed three times over a two-year period and those that pass will qualify for the Healthy Eating in Schools Award. In 2011, 91% of schools attained the Healthy Eating in Schools Award. This award is a prerequisite for schools vying for the Gold or Platinum CHERISH Award.



c. *Health Promoting School Canteen Programme.* The Health Promoting School Canteen Programme is an enhancement of the Healthy Eating in Schools Programme. Participating schools are required to comply with the HESP food service guidelines and serve healthy set meals. These set meals incorporate the appropriate proportions of food from four main food groups – rice and alternatives, meat and alternatives, fruit and vegetables – ensuring that when students consume meals at the school, they receive the right nutrients necessary for their growing needs.



Example of healthy set meals in school

Table 2. Food service guidelines for the Healthy Eating in Schools Programme

- 1) Sale of drinks and desserts with less sugar.
 - a. For commercially prepared sweetened drinks, these must have the Healthier Choice Symbol (HCS) logo. For commercially prepared unsweetened drinks or concentrate (powdered or liquid), the sugar content must be equal to or less than 7g/100 ml.
 - b. For home-made drinks and desserts (e.g. barley, coffee, tea, green bean soup, *tau huay* (soya beancurd), “pearl”/“bubble” tea, *chin chow* and sago),
 - a) the sugar content must be equal to or less than 7g/100 ml
 - b) there shall be no artificial sweeteners (e.g. aspartame) added
 - c) solid ingredients (e.g. canned fruit in syrup, “pearl”/“bubble”, chin chow and sago) which are sweetened shall not be used.
 - c. There shall be no sweetener (e.g. syrup, sugar, honey) added to home-made fruit juices.
 - d. All drink vending machines in the school (including those located outside the canteen area) shall only sell drinks with the HCS logo.
- 2) Sale of deep-fried food and preserved food on only one specified day a week (this specified day shall not be changed). Examples of such food include deep-fried chicken nuggets, deep-fried breaded chicken patty, sausages, preserved vegetables and preserved eggs.
- 3) When high-fat ingredients (e.g. coconut milk/cream, full-cream milk, full-fat yoghurt, full-fat cheese, mayonnaise, cream) are used in food and beverage preparations, half or more of the required amounts of such ingredients shall be replaced with low-fat alternatives (e.g. low-fat milk, low-fat evaporated milk, low-fat yoghurt, low-fat cheese, low-fat mayonnaise and low-fat cream). Butter, lard and ghee shall not be used in food preparation.
- 4) Use skinless poultry and lean meat when preparing food.
- 5) Provide the recommended amounts of vegetables in rice and noodle dishes.
 - a. For rice dishes, provide at least 2 dessert spoons of vegetables
 - b. For noodles, provide at least 1 dessert spoon of vegetables
- 6) Sell at least 2 types of fresh fruit every day.
- 7) Gravy/sauce/soup shall not be served unless requested.
Upon request, do not serve more than 2 dessert spoons of gravy/sauce/soup. This guideline is applicable to stalls selling rice with food items including rice dishes traditionally served with gravy and sauce (e.g. teriyaki chicken rice, char siew rice).
- 8) There must be at least two working water coolers within the canteen area.
- 9) Use wholemeal/whole-grain bread to prepare at least half a sandwich (i.e. a sandwich can be prepared with 1 slice of white bread and 1 slice of wholemeal/whole-grain bread).
- 10) Limit the sale of commercially-prepared crisps, chips, cookies, cakes, biscuits, buns and steamed paus to those with the Healthier Choice Symbol/Healthier Snack Symbol logo.

d. Healthier Canteen Programme. The Healthier Canteen Programme aims to provide healthier food options in the tertiary educational institutions. After attending the culinary training workshop, each canteen stallholder of the participating institutions undergoes an individualised nutrition consultancy session with a nutritionist or dietician to learn how to make their existing menus healthier.

Apart from the educational institutions, HPB also works with hawker centres as well as other dining outlets such as restaurants to provide the general population with healthier food choices. These are prepared with healthier cooking methods and/or healthier ingredients and many are lower in fat, sugar and salt and/or contain more whole-grains, fruit and vegetables. To facilitate easy identification by the public, healthier dishes will be marked by a “Healthier Choice Symbol” logo on the menuboards.

STAKEHOLDER ENGAGEMENT

Teachers and parents are important stakeholders HPB work with. Teachers, including pre-service teachers, are equipped with nutrition knowledge to promote healthy eating in schools. Nutrition education cum culinary training workshops are organised for child care centre personnel and school canteen vendors to hone their skills in preparing healthier food for the children and youth.

HPB also focuses its efforts on parent education and empowerment as parents are important stakeholders in

nurturing and sustaining healthy lifestyles for their children. Culinary training to impart skills to help them prepare healthier meals for their children as well as interac-



Culinary training workshops

tive workshops and online resources are rolled out to engage parents and caregivers.

Increasingly, more studies have shown that a woman's body composition and diet at the time of conception and during pregnancy have important effects on the subsequent health of her offspring.^{4,5} HPB is moving its health promotion efforts further upstream to empower parents-to-be and parents to give their children a healthy head start in life. This will further strengthen the seamless continuum of health promotion efforts for parents and youths, from pre-natal through to adolescence and early adulthood.

A new programme – 'Healthier Child, Brighter Future' will be launched for parents-to-be and parents of young children, up to the age of six. This programme aims to raise awareness of the pre-natal and early developmental influences on health outcomes in later life. It also offers parents-to-be, parents and other key stakeholders the information and skills to empower them to take practical steps to foster wellness during pregnancy and to nurture healthy lifestyles during their children's early years. HPB will reach out to parents-to-be and parents in various settings including workplaces, hospitals and the community to raise their awareness about the pivotal role they play in nurturing the health of their offspring and educate them about how they can shape the health and wellbeing of their children. Collaborations will also be established with the maternity and children's hospitals to advance health promotion efforts targeted at the pre-natal and early developmental stages of life. A health education resource package for new mothers will be developed in collaboration with these hospitals and distributed through these settings to provide the mothers with informative and practical tips to maintain healthy pregnancy and raise healthy children in their early developmental years. Other stakeholders, such as infant and child care centres as well as pre-schools, which are deeply involved in the early growth and development of children, will also be partnered to provide a supportive environment to nurture healthy lifestyles. New evidence-informed dietary guidelines for pregnant women will also be developed.

SUSTAINABLE COLLABORATIONS

HPB works with appropriate food industry partners through the Healthier Choice Symbol Programme to formulate products that are healthier than similar products in the same food category. These products are generally lower in total fat, saturated fat, sugar and sodium. Some of them also contain more calcium and whole-grains.



Eat All Foods In Moderation

Such products are then carrying the Healthier Choice Symbol on their packaging. This helps consumers to look out for healthier products easily.

There are six different classifications of the symbol: 'Lower in Saturated Fat', 'Lower in Sodium', 'Lower in Sugar', 'Higher in Calcium', 'Trans Fat free' and 'Higher in Whole-Grains'.



HPB raises students' awareness on HCS through various platforms including the HCS Bazaar that reaches out to primary and secondary school students.

RESEARCH AND EVIDENCE-INFORMED PRACTICES

HPB leverages extensively on available evidence and conducts research studies in collaboration with local and international academia to ensure that its nutrition education programmes and initiatives are founded upon contemporaneous evidence. Such evidence-informed initiatives are also regularly monitored and evaluated to allow HPB to fine tune them further.

MANAGEMENT OF SEVERELY OVERWEIGHT CHILDREN AND YOUTH

Students who are severely overweight or underweight are referred to HPB's Student Health Centre for a medical assessment to exclude any medical co-morbidities. At the same time, individualised lifestyle counselling in the areas of diet and exercise are offered to these individuals and their parents. Interactive programmes are developed to equip these students with knowledge and skills to positively shape their eating and physical activity practices. These children are then regularly reviewed to monitor their growth and weight status.

CONCLUSION

Indeed, healthy nutrition is a key pillar of healthy lifestyle which needs to be inculcated from young. It is with this intention in mind that HPB pays significant attention to its nutrition education efforts among the young.

AUTHOR DISCLOSURES

The authors declare no conflict of interest.

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培養新加坡的孩童和青少年健康的飲食習慣

健康飲食對預防疾病扮演很重要的角色。在童年時養成健康的飲食習慣特別重要，因這是生長和發育的關鍵時期；而且飲食習慣很早便會形成，甚至是五歲之前。所以，我們絕對不能輕視培養孩童健康飲食習慣的重要性。減少脂肪、鹽份和糖份的攝取；同時提倡大眾攝取足夠的全穀、水果和蔬菜是新加坡保健促進局營養推廣的重點。要達到這個目的，保健促進局採用多方位的方式，以不同的策略來向新加坡的孩童和青少年推廣健康飲食。這篇文章敘述了這些針對青少年的策略及多元化的營養教育活動。

關鍵字：健康、飲食、孩童、青少年、健康推廣