

# Non-Communicable Diseases Watch



衛生防護中心  
Centre for Health Protection



衛生署  
Department of Health

JULY  
2025



## Impact of Physical Activity on Growth, Cognition and Academic Performance in Children

### Key Messages

- Children and adolescents aged 5–17 years should do an average of at least 60 minutes of moderate-to vigorous-intensity physical activity per day, such as walking, cycling, sports activities and active play.
- Physical activity participation not only supports children's physical growth and development, reduces the risk of childhood obesity and associated chronic diseases, but also improves physiological and psychological conditions for maximising cognitive functioning, learning and academic success.

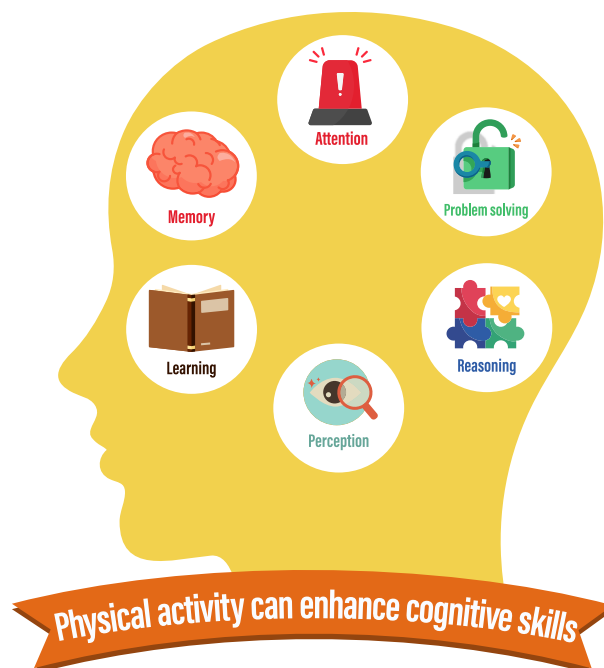
# Play Hard Learn Smart

For children and adolescents, physical activity can enhance fitness, foster growth and body development<sup>1,2</sup>. Compared to less active kids, studies show that active kids have better cardio-pulmonary fitness, stronger bones and muscles, healthier body fat composition, improved metabolic control, enhanced psychological well-being and reduced symptoms of anxiety and depression<sup>2</sup>.

Physical activity, through play and other activities, is also an intrinsic part of children's brain and cognitive development<sup>3</sup>. Children can acquire problem solving skills through games that include learning and following new sets of rules. Through sport participation, children and adolescents can enhance their self-esteem and self-confidence and foster a positive body image in addition to the physical abilities and skills that they develop<sup>2,4</sup>.

For optimal growth and development, infants should be given adequate opportunities to move freely that include kicking, tummy time, rolling over, crawling and standing in a safe setting. Toddlers and preschoolers need plenty of time to learn and practice gross motor skills by participating in a variety of free plays, such as throwing, catching, jumping and running.

This article presents the World Health Organization (WHO) guidelines on physical activity for children and adolescents, discusses the neurological effects of physical activity on children's cognition and academic performance, as well as advises parents and caregivers on how to integrate more physical activity into children's daily routines.



## Guidelines on Physical Activity for Children and Adolescents

Physical activity can be classified by the level of intensity: high, moderate and light. To measure relative intensity, the talk test is one of the simplest ways (Table 1)<sup>5</sup>.

Level of intensity	Indicator
High	Children would become out of breath and cannot talk normally. Examples include running, rope jumping, dancing, swimming, playing football, playing active games and sports involving running or chasing
Moderate	Children can speak in short sentences or single words. Examples include brisk walking, tricycle/bicycle riding on flat surface, paddling, playing on slides, swinging and playing games that require catching and throwing
Light	Children can easily speak in full sentences and talk normally. Examples include slow walking, playing toys, putting on clothes, grooming, packing school bags and doing household chores

Table 1: Relative intensity of physical activity and indicators

The WHO developed guidelines on physical activity for healthy children and adolescents (Figure 1) applicable to different gender, cultural background or socio-economic status of families. Children and adolescents with disabilities or chronic diseases should also avoid being inactive; they still need to be physically active in order to keep optimal body functions and stay healthy. Parents and caregivers can consult doctors for advice on the amount (frequency, intensity and duration) of physical activity<sup>6,7</sup>.





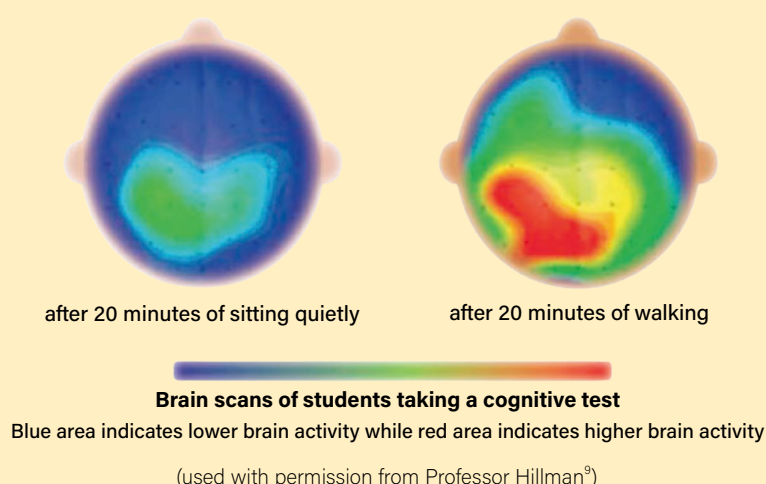
Infants (less than 1 year of age) <sup>6</sup>	Young children at 1–2 years of age <sup>6</sup>	Young children at 3–4 years of age <sup>6</sup>	Children and adolescents aged 5–17 years <sup>7</sup>
			
<ul style="list-style-type: none"> <li>Be physically active several times a day in a variety of ways, particularly through interactive floor-based play</li> <li>For those not yet mobile, this includes at least 30 minutes in the prone position spread throughout the day while awake</li> </ul>	<ul style="list-style-type: none"> <li>Spend at least 180 minutes per day in a variety of types of physical activities at any intensity, including moderate- to vigorous-intensity physical activity, spread throughout the day</li> </ul>	<ul style="list-style-type: none"> <li>Spend at least 180 minutes per day in a variety of types of physical activities, of which at least 60 minutes is moderate- to vigorous-intensity physical activity, spread throughout the day</li> </ul>	<ul style="list-style-type: none"> <li>Do at least an average of 60 minutes per day of moderate-to vigorous-intensity, mostly aerobic, physical activity, across the week</li> <li>Vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone, should be incorporated on at least 3 days a week</li> </ul>

Figure 1: Guidelines on physical activity for children and adolescents

## Enhance Children's Cognitive Functioning and Learning Efficiency through Exercises

Aerobic physical activity such as walking, running or jumping that increases the heart rate and breathing would increase cerebral blood flow and boost brain function. At as short as 20 minutes of walking, research found that increased oxygen supply to the brain would boost neural activity, facilitating better cognitive processing and learning efficiency<sup>8,9</sup>.

### The Positive Effect of Walking on the Brain



Physical activity can stimulate the growth of nerve cells and neural networks in the brain<sup>10,11</sup>. A study investigated the longitudinal associations of physical activity with brain morphology changes as quantified by magnetic resonance imaging among 1 088 children. Results showed that more physical activity during the transition from late childhood to early adolescence was associated with an increase in the volume of the amygdala (an area of the brain responsible for emotional regulation, behaviour control and learning) and hippocampus (an area of the brain involved in storing and processing memories as well as learning)<sup>12</sup>.

Active kids are healthy kids and they tend to fare better at school<sup>13</sup>. Improved physical fitness and healthier mind exert additional positive effects on academic performance, especially in subjects like mathematics and language which require active thinking, reading and working memory<sup>13-15</sup>. As shown in Figure 2, participation in sport and other forms of physical activity can maximize children's cognitive functioning, learning and academic success<sup>4, 13, 14</sup>.

A study of nearly 12 000 adolescents in the United States showed that active adolescents were 20% more likely to earn an "A" in mathematics or English compared with their sedentary peers<sup>16</sup>. Another study examined the association between sports team participation and academic performance among 27 954 Chinese children aged 10–14 also showed that children who participated in sports teams were more likely to achieve better grades in mathematics, Chinese and English<sup>17</sup>.

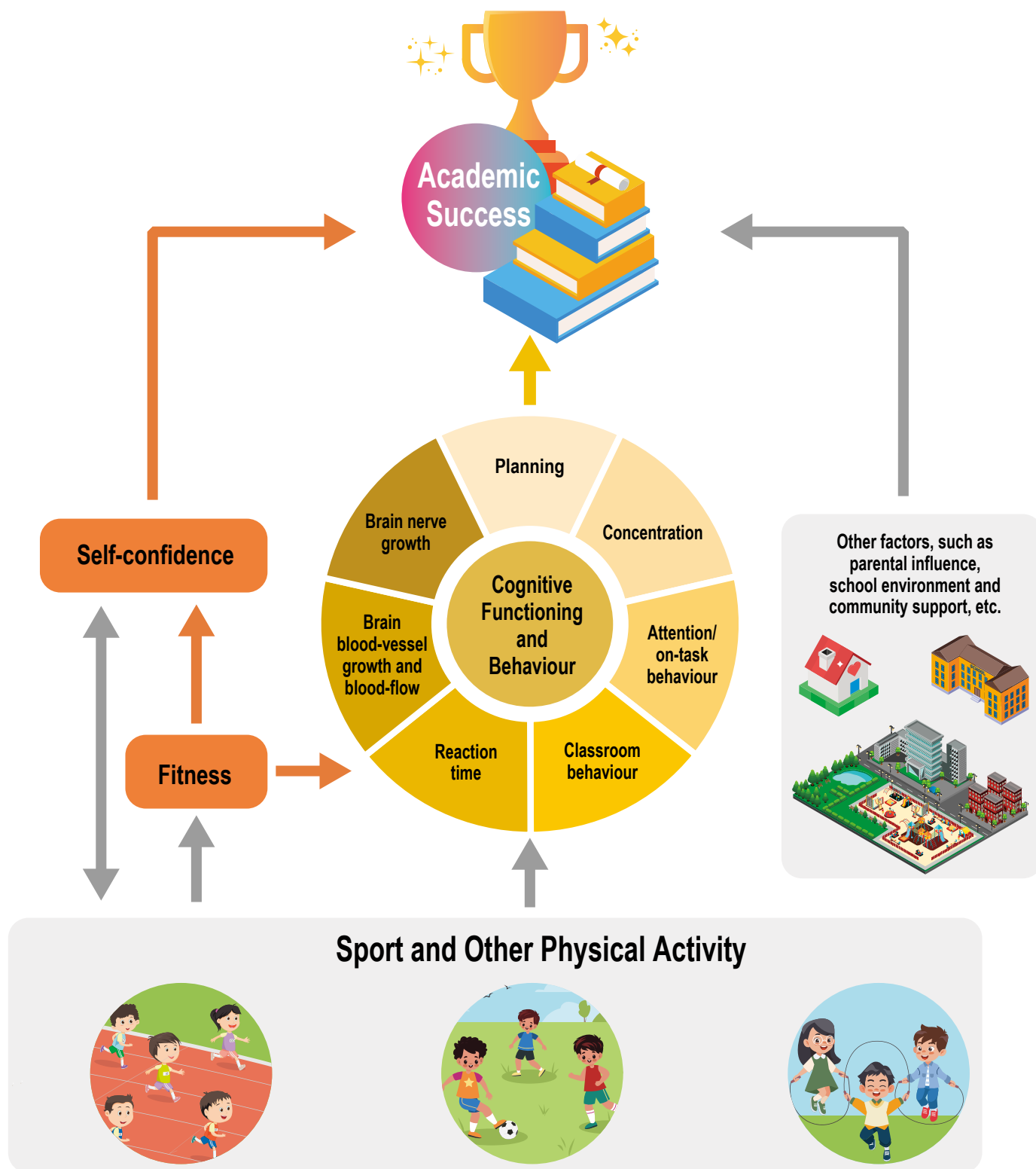


Figure 2: Move more to enhance learning and academic success (modified from Brain Boost 2010 and 2015)



# Nurturing Active Healthy Kids

Childhood is the key time for establishing physical activity behaviours and promoting the development of motor skills that very often carry over into adolescence and adulthood, and thereby ward off obesity and related chronic diseases as well as mitigate age-related changes in the brain and reduce the risk of cognitive decline later in life<sup>18, 19</sup>. For healthy growth and development, children need a regular mix of indoor and outdoor, unstructured and structured physical activities. Unstructured physical activity refers to self-initiated or selected free play. Playgrounds, parks and beaches are great places for children to have some unstructured outdoor activities. They can flap their arms like a bird, hop like a bunny, gallop like a horse, chase bubbles, throw or kick balls, play 'red light, green light' or 'what time is it, Mr Fox?', games that can exercise their large muscle groups, boost their balance and improve motor coordination. Structured physical activity refers to guided or directed by an adult with a specific purpose and set of parameters. School-age children and adolescents should be encouraged to participate in more structured activities involving physical effort and skills.

Letting children and adolescents try a variety of types of physical activities and sports that are enjoyable and appropriate for their age can help them stay interested, get enough exercise and acquire different motor skill sets that they can use for a lifetime. Below are some suggestions that parents and caregivers can follow and integrate more physical activities into children's daily routines —

**Act as a good role model by being physically active**



**Encourage children to walk more or toddlers to walk short distances rather than sit in a stroller. Walk children to and from schools, parks, shopping malls or other places, or take children for a walk after dinner**

**Give children toys or gifts that promote physical activity, such as balls, rackets, skipping ropes, hula hoops, tricycle/bicycle, scooters, step counters or fitness trackers for children**



**Arrange outdoor activities. Bring children to playgrounds or parks often and play with them, or to beaches or swimming pools and swim with them**

**Help children select school-based or community physical activity programmes that meet their interests and developmental needs. Join them in extra-curricular physical activities**



**Encourage children to offer their ideas or suggestions for physical activity. Play and motivate them to be physically active with praise or small rewards**

Schools serve as an excellent setting to provide children with the opportunity for daily physical activity, to teach the importance of regular sport participation for health, and to build skills that support an active lifestyle. Parents and caregivers should pay more attention to their children's physical activities in school and arrange enough physical activities after school. By increasing the opportunities for children to participate in physical activities through home-school cooperation, we can nurture active healthy kids.



Since the 2011/12 school year, the DH launched the StartSmart@school.hk Campaign with an aim to create conducive environments for physical activity and healthy eating for young children in the school and at home.



## Whole School Health 全校園健康計劃 Programme

The DH also launched the Whole School Health Programme in the 2023/24 school year with reference to the Health Promoting School Framework advocated by the WHO. Under the Whole School Health Programme, the DH assists participating schools to systematically review and formulate school-based measures to promote physical activity, healthy eating, mental health and social well-being, thereby gradually becoming 'health promoting schools' that are beneficial to living, learning and working.



**Physical Activity and Academic Success: It's A Win-Win**

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免費康體活動  
Free Recreation and Sports Programmes

免費使用康樂設施  
Free Use of Leisure Facilities

The Leisure and Cultural Services Department (LCSD) will hold the Sport For All Day 2025 on 3 August 2025 (Sunday). This year, the slogan will remain "Stay Active, Healthy and Happy!" to encourage people of all ages and abilities to engage in regular sports and physical activities, and promote the benefits of exercise for the body and mind. With the theme "Coalescing together for the National Games", this year's event aims to foster community spirit in support of the 15th National Games. On the event day, a series of free sports and recreation programmes will be offered at designated LCSD venues across the 18 districts, while most of the LCSD leisure facilities will be open for free use by the public. For details of the Sport For All Day 2025, please visit the website at [www.lcsd.gov.hk/en/sfad](http://www.lcsd.gov.hk/en/sfad).

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