

# Prevention of Overweight and Obesity among School Children in Sri Lanka

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Family Health Bureau  
Ministry of Health, Nutrition and  
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National Institute of  
Education



Ministry of Education

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## Objectives of this Guide

Despite the fact that many programmes are presently in place to overcome nutritional deficiencies that have been identified among our children island wide it is well worth to note that no systematic programme has yet been implemented to tackle the similarly important problem of overweight and obesity among our school going population.

Children who are overweight and obese are bound to face a number of non-communicable diseases when they reach adulthood such as over-weight, type II diabetes mellitus, high blood pressure and heart disease and these would also no doubt render them incapacitated and also, in the end lead to their untimely death. It has now been brought to light that it is much more cost-effective to treat obesity and overweight in childhood rather than to treat its repercussions stated above that emerge in adult hood. This book recognizes overweight and obesity as current problems present amongst our children and is therefore a preliminary effort to strive to implement appropriate preventive measures. Furthermore, this guide has strived to incorporate all aspects relevant to the prevention of over-weight and obesity among school children. It is of utmost importance that the school community be empowered and strengthened to value and promote good health values and behaviours that discourage overweight and obesity. This book would therefore no doubt be a handy guide not only to the school community which includes the students, teachers and other education officials but also for the officials in the Ministry of Health who would all no doubt be instrumental in creating such healthy environments within schools.

This guide discusses in details the intermediate and long-term effects of unhealthy food habits and sedentary life styles. It also provides a lengthy description of age appropriate healthy foods and physical exercise. The ultimate aim of this guide is to reduce the burden of non-communicable diseases among our emerging young adult population and thereby improve their quality of life as well as their personal expectations. Healthy lifestyles is also an essential element of happy and peaceful families.

We therefore sincerely and fervently hope that this guide would serve both as an educational text as well as a health educational tool to achieve these objectives.

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## Message from the Director General of Health

The indices that the future of a country depends on the production capacity of a country and the effectiveness and efficacy of its working population. If the technical knowledge needed to improve the production capacity is generated from within the country itself, then the production of a country is bound to further increase. This however, not only requires that the workforce of the country is of high intelligence but also that they be healthy.

"Developing a future workforce" Which is considered as an out-come of education requires that this future workforce be both physically and mentally healthy. Both healthy food and appropriate physical activity have been recognized as important and vital elements responsible for a child's physical and mental development.

It is of utmost importance that children from a very young age fulfill their nutritional requirements appropriately to ensure that they grow up healthy. However, studies carried out during the past few years have unfortunately shown that our children suffer from a variety of nutritional problems. Overweight and obesity have been identified as an important nutritional problem which is considered as a major risk factor for non communicable diseases, that require our urgent attention and intervention. The responsibility laid upon us, as health professionals to overcome this challenge successfully is immense. It is our prime duty to direct the school children of today who are the lifeline and future of our society on a healthy path in order to ensure they reach a healthy and productive adult life. This would also no doubt be a great investment for our entire nation.

The guide has been prepared by the Family Health Bureau of the Ministry of Health in collaboration with the National Institute of Education and the Ministry of Education is I feel an important and timely step in realizing the above objectives.

**Dr. Anil Jayasinghe**

Director General of Health

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## Preamble

Overweight and obesity are now worldwide problems and the World Health Organization has identified strategies for their treatment and prevention. It is also important to identify methods that are specific to Sri Lanka. Prevalence of both obesity and non-communicable diseases (NCD's) is rapidly rising in Sri Lanka. Sri Lanka is experiencing the demographic and nutrition transitions and is facing all the challenges of socio economic development and related changes in lifestyle and the food environment. This change affects not only the nutritional status of the urban population but is fast reaching a majority of the rural areas as well. Hence it is imperative that overweight/obesity is targeted for all school children across the country.

Another unique problem encountered by developing countries including Sri Lanka is the persistence of under nutrition in this same environment. This is mostly micronutrient deficiency (e.g. childhood wasting and iron deficiency anaemia), which is more common among the poorer communities. Evidence shows that individuals who are undernourished in foetal life and in childhood are less able to handle exposure to excess energy intake later in life. They are more prone to become overweight/ obese and are thus more susceptible to develop NCDs.

Overweight/obesity is caused by many factors and therefore all aspects of this problem need to be understood and addressed by successful prevention strategies. Both the poor and the affluent are now exposed to the similar food and lifestyle. This environment is known as the "obesogenic environment" as it promotes the development of obesity. Behavior changes have arisen due to relying on convenience, ready to eat foods, reduction in physical activity and increase in sedentary lifestyles. These are significant contributory factors for the development of obesity especially in adolescents. The results-driven-competitive education system which places less emphasis on sports and physical activity, has led to adolescents being preoccupied with educational work and reducing their activity level.

Cheap food of poor quality is often energy dense (high in energy per unit weight) but poor in micronutrients. A small quantity of this type of food may lead to under-nutrition and micronutrient deficiency, while a larger quantity may lead to obesity with or without micronutrient deficiency. Both conditions existing in the same community is called the double burden and may even be seen in the same family or in the same individual. On the other hand pricing has another effect. There are 'expensive' foods from multinational food chains which are often misjudged as 'status foods'. They are palatable and energy dense, but deficient in most micronutrients. At the same time regular nutritious food items are often not eaten in adequate amounts to fulfill the daily nutritional needs.

Adolescents and children who look for better palatability and have higher nutrient requirements are the most affected. As food related behaviors become ingrained at an early age and persist throughout their life, this would negatively affect their health over a longer period of time.

The facts in this booklet are supported by both global and Sri Lankan data. High blood pressure, insulin resistance and dyslipidemia among adolescents at younger ages

- (1) A study of 8,497 urban adolescents aged 10–14 years and 4,763 urban adolescents aged 15–19 years revealed a raised BMI in 19.7% of 10–14 year old children and 15.3% in 15–19 year old children. Raised waist circumference (WC) was seen in 42.7% of girls and in 32.1% of boys at 10-14 years and 28.1% in girls and 16.1% in boys in the 15 - 19 year old children. Metabolic syndrome is associated with abdominal obesity and was recorded in some adolescents between 10 and 16 years of age
- (2) National prevalence of overweight/obesity in adolescence is 4.6% whereas it is more than 20% among School Children in urban areas.
- (3) Adolescents who are overweight have an increased cardio metabolic risk. Sri Lankan adolescents in all sectors are at risk. Therefore it is essential that a national preventive and treatment strategy is put in place without delay supporting the existing national policy. It must begin with the unborn child and should take a multi-stakeholder approach which includes the schools and the health system.

# Essential facts about over weight and obesity

## Chapter 01

### What is overweight & obesity

**Overweight/obesity is due to having excess amounts of body fat in a person that leads to the development of non-communicable diseases. It is diagnosed when a person has an inappropriately high weight for his/her height.**

This can be identified by plotting BMI for age chart, which is available in the Child Health Development Record (CHDR).

**Children between 5 - 19 years of age**

$$\text{Body Mass Index} = \frac{\text{Weight (Kg)}}{\text{Height}^2 (\text{m}^2)}$$

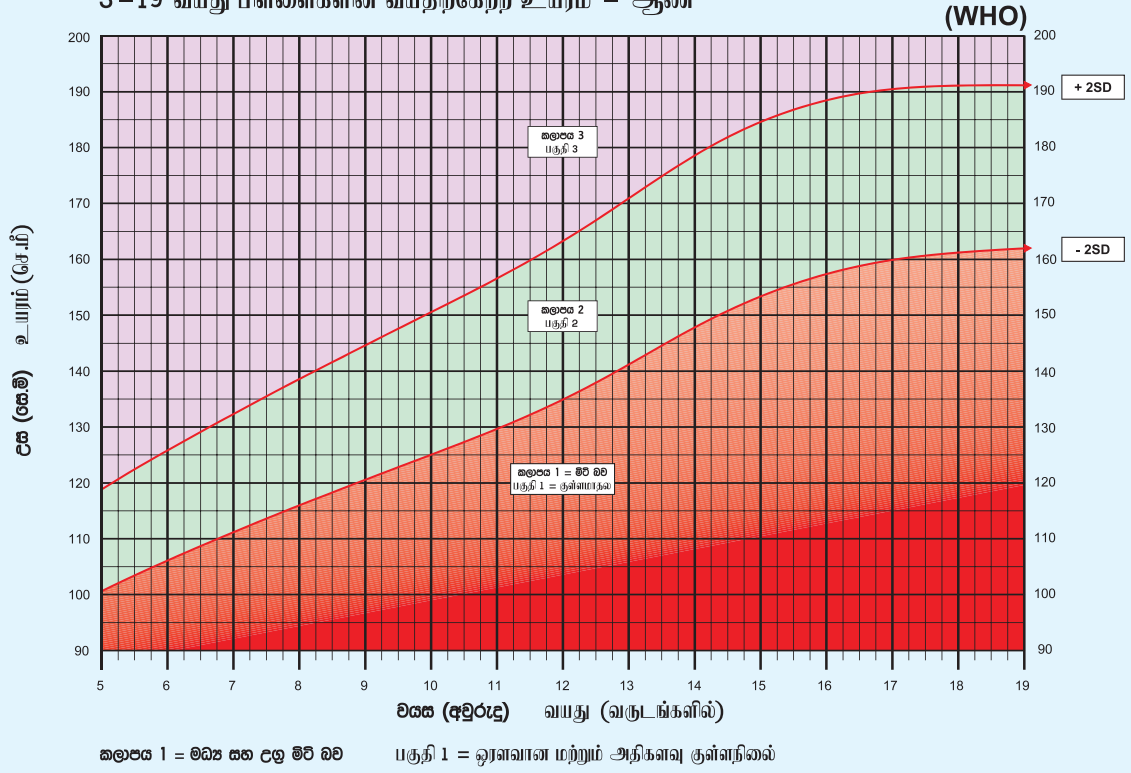
### Diagnosis of overweight & obesity

**Plot the BMI of the child against the age**

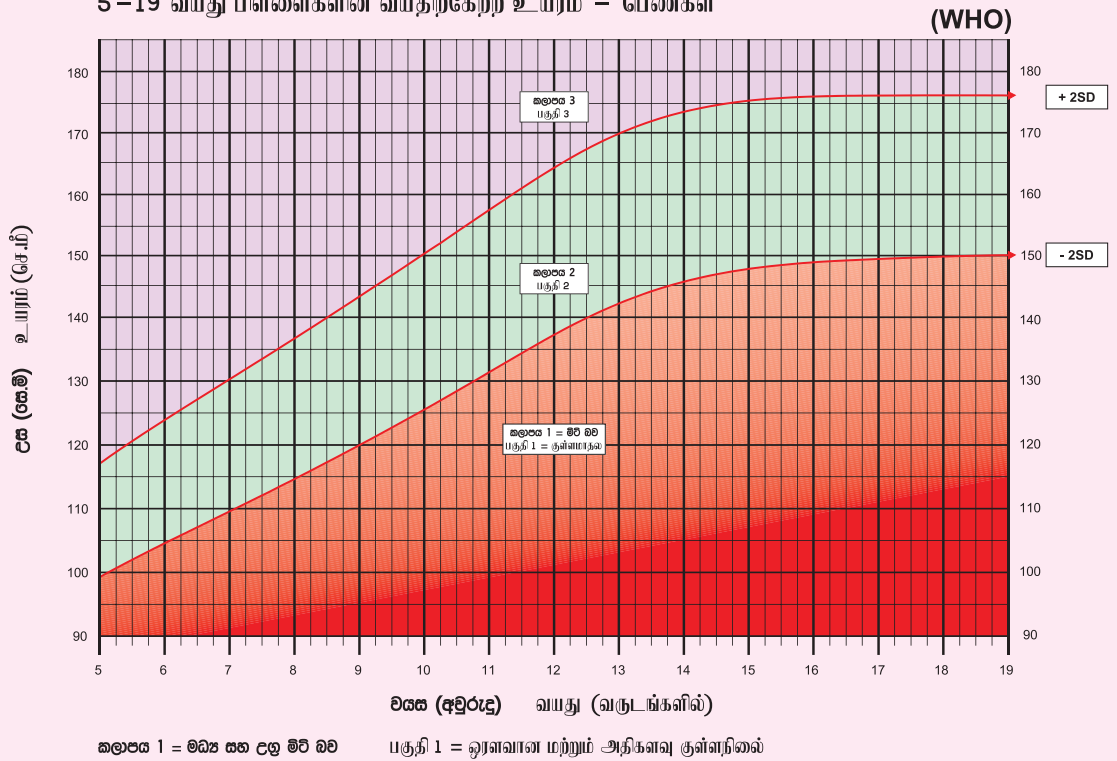
	Range	Diagnosis	Colour in the CHDR
BMI for age	+1SD — +2SD	Overweight.	
	>+2SD	obese	

Gender specific charts are available in the CHDR which are based on WHO standards

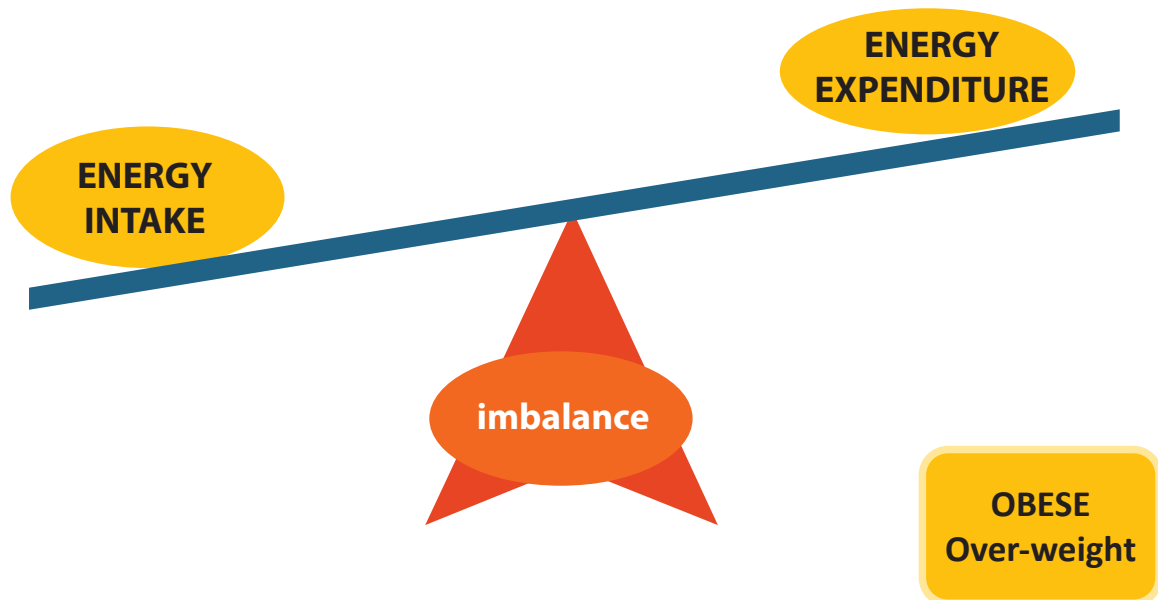
**அடி 5-19 க் அகர் பூதிகளே வககப அதுவ டக - சிஃதி**  
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- Childhood obesity is becoming a common problem in Sri Lanka.
- Obesity begins due to an imbalance between the intake and expenditure of energy in the body, which results in deposition of excess energy in the body in the form of fat.



Energy intake > Energy expenditure → Deposition of excess energy as Fat

### Why early interventions are needed?

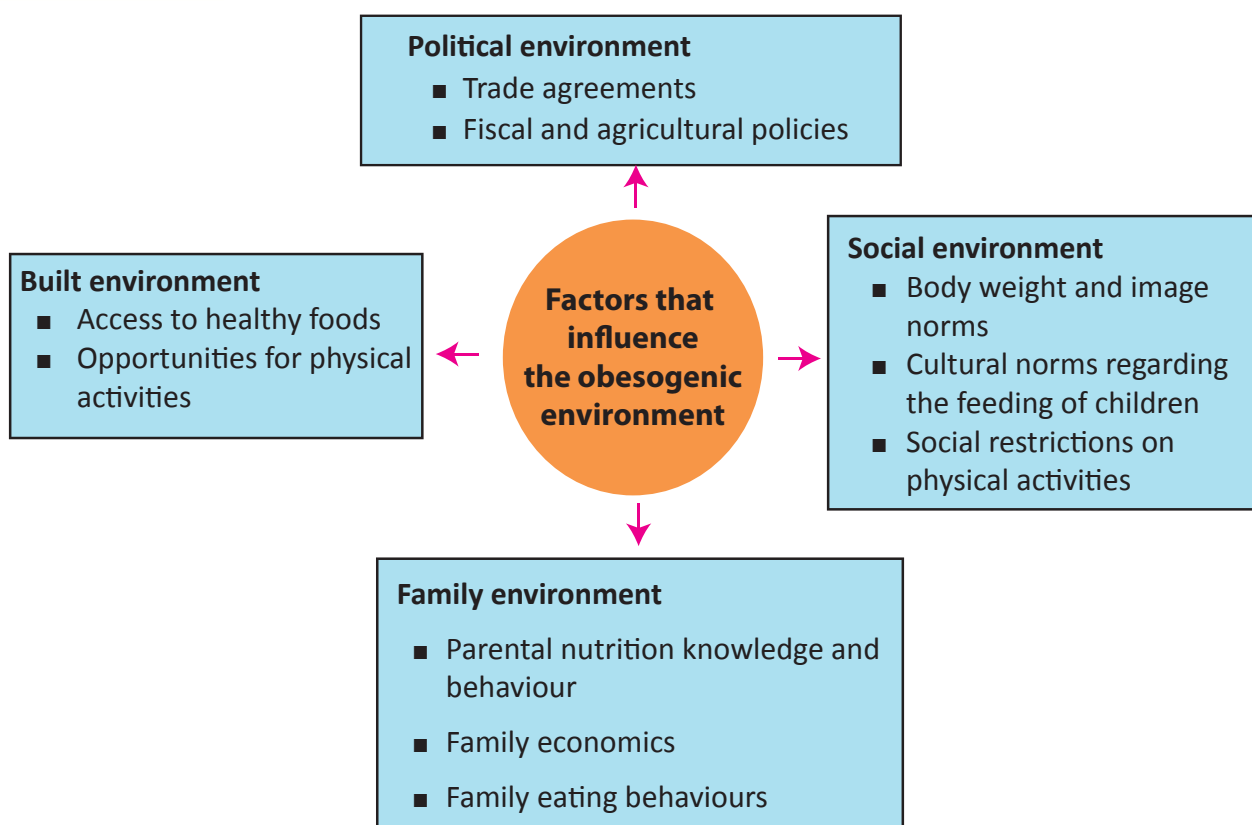
Most of the obesity related illnesses occur in adult hood. However, changes (inside the body) related to obesity begin during childhood. Therefore it is important to identify these children at an early stage and intervene as early as possible to reverse these changes before they progress to the development of non-communicable diseases.

Once a child becomes obese, it is very difficult for him/her to lose weight later in life. Some of the changes that occur with obesity during childhood like large abdomen or sagging breasts in a boy are difficult to reverse. Majority of these children end up being obese adults and develop related illnesses like hypertension & diabetes at a relatively younger age of life. This can lead to disability in adulthood and pre mature deaths.



# Factors affecting overweight and obesity

Factors affecting overweight/obesity can be conceptually classified under four themes



To challenge childhood obesity successfully requires addressing of;

- Obesogenic environment
- Special periods in the life-course.

Children are exposed to obesogenic environments from the early childhood due to various changing dynamics such as:

- The changes in food type available in the market,
- Availability and affordability of food,
- Marketing strategies adopted by industry.
- Reduction in physical activity
- Automation of daily life
- Availability of more private transport
- Lack of garden space and lack of places for recreation
- Parents discouraging play activity with children in neighborhood
- Consumers are not adequately informed about nutritional values and caloric content of food.

The major goals of addressing the obesogenic environmental component are through encouraging healthy eating and physical activity behavior of children.



# Outcomes of overweight and obesity

## Chapter

# 03

Obesity leads to the development of; immediate effects as well as long term effects.

### Physiological Effects

- High blood pressure,
- Diabetes,
- Difficulty in breathing
- Damage to liver resulting in cirrhosis
- High blood cholesterol
- Obstruction of blood supply to the heart and brain using heart attacks and strokes
- Changes in colour of skin specially around the neck, arm pits, groin areas (acanthosis nigricans)
- Cancers (breast, Colon, Ovary)
- Bone abnormalities
- Irregular menstruation leading to sub fertility later in life
- Psychological-social stress- e.g.
  - Poor self-esteem,
  - Depression
  - Lack of friends,
  - Difficult to find jobs
  - Difficult to find marriage partners.
  - Social Isolation



## Chapter 04

# Life cycle approach in management of obesity

**Obesogenic environment has an impact on all stages of life. Therefore childhood and adolescent obesity has to be addressed taking the life course approach into consideration.**

Three distinct times of life course has to be addressed

- Preconception and pregnancy
- Infants and early childhood (birth to five years of age)
- Older children and adolescence

### 1. Preconception and pregnancy

It is important that a female embarks on a pregnancy in good health. Therefore the growth and lifestyle of the girl child need to be improved. She needs to take a healthy diet with adequate exercise enabling her to achieve optimum growth before embarking on a pregnancy.



Even during pregnancy a healthy lifestyle has to be maintained by way of taking nutritious food, adequate exercise and not being exposed to harmful substances. During pregnancy proper weight gain and proper glycaemic control are important.

### 2. Infancy and early childhood

- As it is clearly shown that the early diet and dietary behaviours help in developing tastes and food habits leading to a proper growth. Following the Infant and Young Child Feeding guidelines, recommended for Sri Lanka will help to establish life long healthy dietary behaviours in children.
- Exclusive breast feeding from birth until the completion of six months is recommended. Apart from providing the baby with adequate nutrients it also provides many long term health benefits to both the child and mother. E.g. reduce risk of overweight and obesity in later life.



- Complementary foods introduced from the completion of 6 months while continuing to breast feed for a period of two years or more.
- A variety of foods should be introduced in age appropriate adequate quantities and adequate number of meals to provide required energy and nutrients for growth and development.
- From one year of age the main source of nutrition should be nutritious family food. Three main meals and two snacks in between meals are recommended from 9 months onwards. Main meals should not be missed.
- Responsive feeding should be started from the very beginning of complementary feeding.



Binge eating should be discouraged. Foods such as toffee, biscuits, sweets and junk food should not be freely available to the child. Children should be encouraged to engage in physical activity under supervision.

It is important to do regular growth assessment and taking remedial measures to promote optimal growth. If the weight for age is going up rapidly immediate referral must be done.

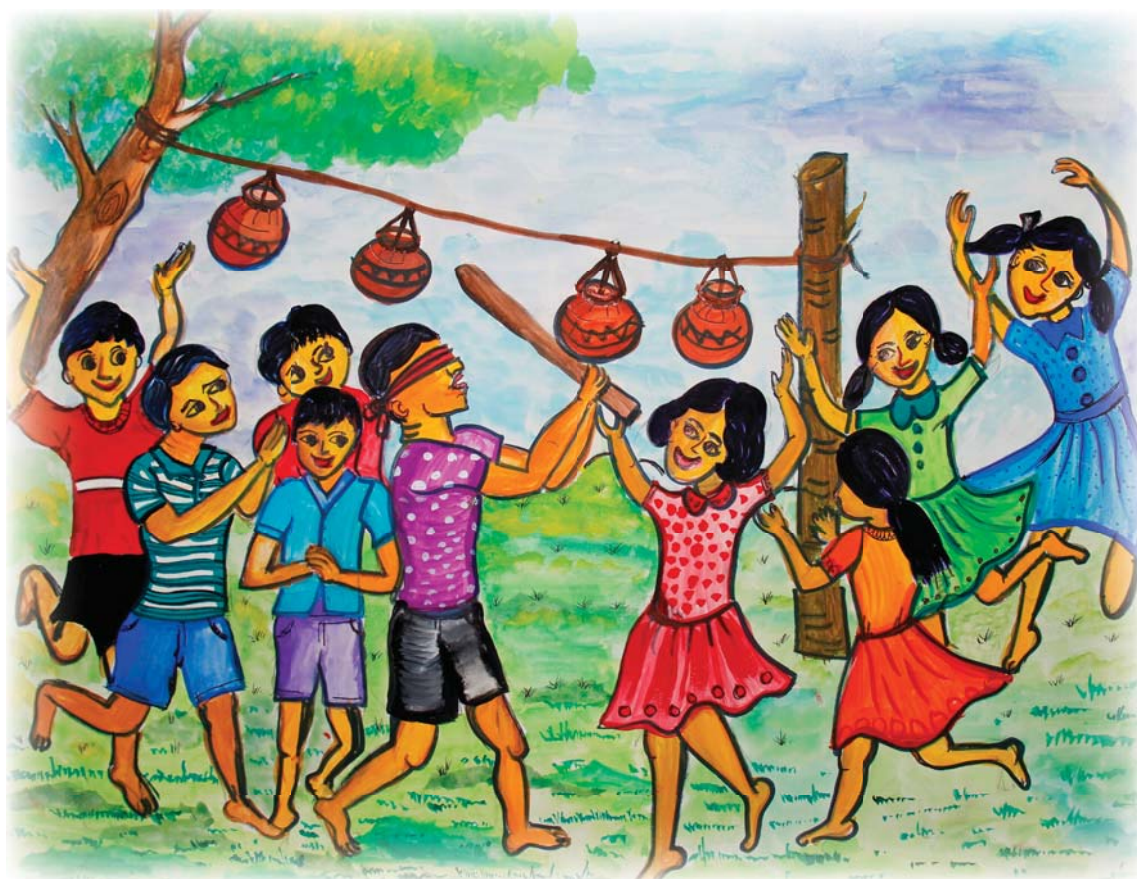




### 3. Older children and adolescents

Older children and adolescents must be encouraged to practice the following recommendations.

- Eat regularly. Take 3 main meals and 2 snacks in between. Do not miss main meals. This will lead to eating energy dense food as snacks.
- Include starchy foods like rice, bread, cereals at every main meal. The amount should be about half the plate. Always try to take whole grain cereals as it will increase the fiber content and also provide many other nutrients.
- Include vegetables, green leaves and fruits to each meal. Vegetables and green leaves should fill about  $\frac{1}{3}$ rd of the plate at each main meal.
- Limit food high in sugar such as sweets, chocolate and biscuits.
- Limit food high in fat such as crisps, chips pastries and other short eats.
- Limit fried food especially deep fried foods. Eat food with healthy fat.
- Water is the best drink. Discourage frequent intake of sweet, carbonated drinks.
- Encourage daily physical activity for at least 1 hour.
- Discourage use of screen devices. (Eg. Smart phones, tabs, computers, television)



### Recommended Dietary Allowances for school Children

Boys/Girls	Age	Calories/day	Calories from Fat/day	Protein/day	Added Sugar/day	Salt/day
	6-9yrs	1725kcal/day	25%-35% of calories/day	34g/day	3tsp/day	3.5g/day
	10-11yrs	2100Kcal/day	25%-35% of calories/Day	50g/day	5-6tsp/day	5g/day
	12-15yrs	2400kcal/day	25%-35% of calories/day	65g/day	6tsp/day	5g/day
	16-18yrs	2500kcal/day	25%-35% of calories/day	69g/day	6tsp/day	5g/day

Data source - MRI Sri Lanka



## Chapter 05

# Recommended strategies for management of obesity

### Strategies to reduce the obesogenic environment

1. Weight management
2. Promotion of intake of healthy food
3. Promote physical activity
4. Reduce sedentary activities
5. Draw policies to promote health, nutrition and physical activity for school children



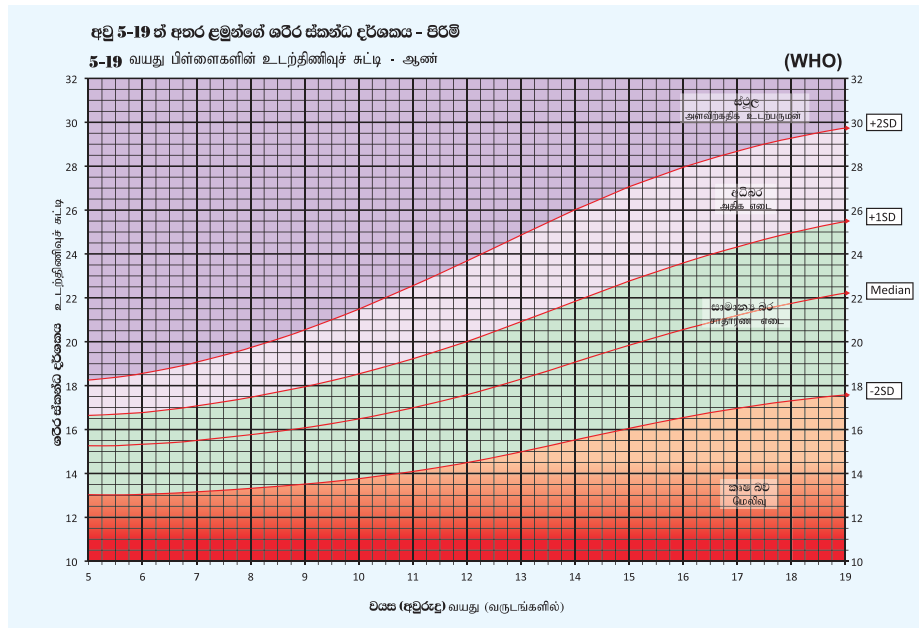
### 1.1 Weight management

Weight management is an important aspect in the early detection of over weight as well as in taking preventive action early. In addition to taking correct measurements, it is important to plot them on the chart as well as to interpret and to decide on what course of action needs to be taken.

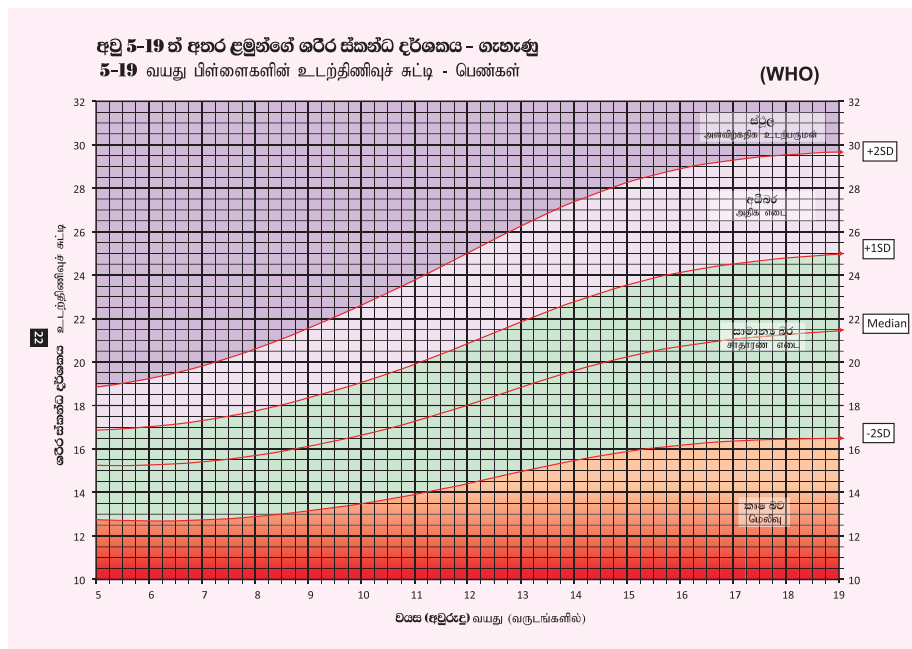
Intervening for any inadequate weight gains while ignoring higher weight gains is commonly seen. Weight gain should be within a limit and any deviations need to be addressed.

- BMI is important for the proper interpretation of the nutritional status and health of children above 5 years of age.
- Calculation of BMI and interpretation is to be done by students (especially above 10 years- Grade 6) at school level. It is important to identify any deviation from the normal growth and also to inculcate the habit of calculating the BMI among children.

The IEC materials provide to the schools to empower children to plot their BMI & follow the relevant instructions for the management of their own BMI according to the colour of the zone which they lie in the chart.



1. Gender specific BMI for age and height for age charts
2. Weight management chart.
  - Both children and parents should be willing to undertake the management plan. Special attention should be given to the behaviour of the child and the other members of the family.
  - All overweight children should be referred to the Nutrition clinics of the MOH.
  - All obese children should be referred to paediatrician or an Endocrinologist.





## 2. Promotion of intake of healthy food

Healthy diet is the key to prevent obesity and to have a healthy life. Recommending Daily requirement according to the six food groups. Children must get three main meals (breakfast, lunch and dinner) per day and two snacks in between. Main meals should not be skipped.

### 2.1 Healthy diet with six food groups

According to the Food Based Dietary Guidelines, it is recommended to have a variety of food every day, in recommended quantities to form a healthy diet. Quantities could vary according to the age, sex, body size and daily activities. However, everyone should get their daily requirement of energy and nutrients from the following six groups of food, to keep themselves healthy.

#### 1. Grains (cereals) & tubers (yams)



3. Fruits



#### 2. Vegetables,



4. Fish/ pulses/ meat/ eggs



## 5. Milk/ milk products



## 6. Nuts & oil seeds.



In addition, having an adequate amount of water is essential for a healthy life.

Diet with high sugar and fat lead to childhood obesity. Therefore it is important to include some item (s) from all the above food groups in correct portions rather than a large quantity from few groups. Otherwise it would lead to an imbalance in the diet. Hence it is important to educate on the variety as well as the quantity of food intake. Food Based Dietary Guidelines (FBDG) as well as the food plate model can be used for this.

## 2.2 Food plate concept for main meals

A wholesome meal must be taken for breakfast before coming to school even if a meal is provided at the school. .

- Starch-based food must form around half of each main meal. Rice and other cereals, grains or yams three times a day fulfill the most of the energy requirement. It is healthy to include more fiber-containing-starchy-food such as whole cereals, pulses, tubers, yams or legumes than white bread and other refined products.
- Green vegetables and green leaves should be about two thirds of the balance half of the plate (or one third of the whole plate). It is recommended to have at least three varieties of vegetables per day. Vegetables from many different parts of the tree, including leaves, roots, tubers, flowers stem & seeds . By adding variety at vegetables in different colour into each meal provided you with good source of Vitamins, minerals dietary fibre & carbohydrate.

**Table1: Recommended portion sizes for a day of each food group according to age group.**

	Starchy food	Pulses & Legumes	Vegetables	Fruits	Dairy Products	Animal food	Extra food
Children 1 - 4 yrs.	2 - 3	1	2 - 3	1 - 2	2 - 3	$\frac{1}{2}$ - 1	1
Children 4 - 7 yrs.	3 - 4	1 - 2	4	3	3	$\frac{1}{2}$ - 1	1 - 2
Children 8 - 11 yrs.	4 - 6	2 - 3	4 - 5	2 - 3	3	1 - $1\frac{1}{2}$	1
Children 12 - 18 yrs.	4 - 7	2 - 3	5 - 9	3 - 4	3 - 5	1 - 2	1 - 3

**List of portion sizes of food belongs to each group.** A cup is considered to be 200ml in volume.

### Starchy foods

1 portion size is equivalent to;

- 1 slice of bread (1/9th of 450g loaf of bread)
- 1 cup cooked rice, pasta, noodles
- 1 cup porridge, 1 cup break fast cereal flakes
- 5 string hoppars
- 2 hoppars
- ½ Roti (about 10cm diameter and 0.5 cm thick)
- 1 Those (about 10cm diameter)
- 1 Parata (about 15cm diameter)
- ½ Naan (about 8cm diameter and 2cm thick) Boiled corn of  $\frac{3}{4}$  cup
- ½ cup of pasta, spaghetti, macaroni
- ½ cup of jack, bread fruit etc
- 1 piece of pittu (3x2 cm piece)
- 2 cream cracker or non sugary biscuits

### Pulses and Legumes

1 portion size is equivalent to;

- ½ cup cooked green gram, kadala, c owpea, dhal and soya bean

### Vegetables

1 portion size is equivalent to;

- 50 g or ½ cup cooked leafy vegetables
- 3 table spoons of cooked beans, peas or lentils
- 1 cup salad vegetables (raw), or cooked vegetables; pumpkin, “puhul”
- 1 medium size start chy root like potato, manioc,

### Fruits

1 portion size is equivalent to;

- 1 medium piece fruit of, eg: apple, banana, orange, pear, papaw, mango, guawa, custard apple, pine-apple
- 2 small pieces, eg: apricots, plums
- 1 cup diced pieces or canned fruit
- ½ glass (100 ml) of fresh juice (papaw, water melon, Orange, lemon)

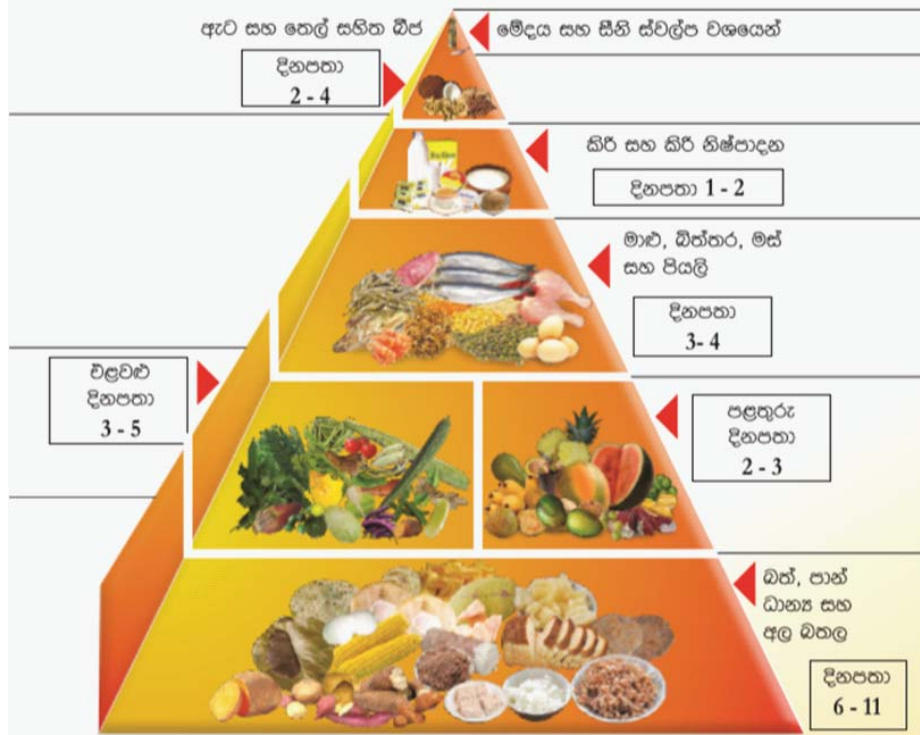
### Dairy products

1 portion size is equivalent to;

- 250 ml (one cup) fresh or reconstituted dried milk
- 40 g (2 slices) cheese
- 100g yogurt (~1 cup)







- Protein rich food should fill the remaining one third of the plate. Eggs contain high quality protein superior to the proteins found in meat, milk or fish. However, fish or dried fish is also a good source of quality protein. Fish and dried-fish are easily digestible, low in saturated fat and have a wide variety of nutrients. Therefore, it is highly recommended to include a piece of fish or dry-fish or meat or an egg as a protein rich food for children as high quality protein is essential for children's growth. Adding some pulses into a main meal is also encouraged as they are not only good sources of protein but also are rich in soluble fiber, complex carbohydrates, vitamins, and minerals. Sprouted green grams can be used in salad to add variety into meal.

- Two Varieties of fruits are recommended for daily consumption. Select seasonal fresh fruits as it's saves money.

To relieve thirst, the best drink is water. Other fizzy sugary drinks are not good for health as they will contribute to obesity as well as lead to decay of teeth.

A fruit drink prepared at home is a good alternative drink. One can blend the fruit (even in corporation all part like seeds, skin etc) but should not strain and remove the fibre and also should not add sugar in to it. To improve palatability could have it chilled a little.





The food pyramid, guides the quantity you need to take from each food group

### 2.3 Snacks

Snacks must be healthy; boiled grams, peanuts, fresh fruits, yoghurt or some milk product with less or no sugar are recommended as healthy snacks; Food items with high sugar, salt or fat such as cakes, biscuits, pastries, rolls, chocolates and fizzy drinks are not recommended for regular consumption.



Deep fried food items should be discouraged and be replaced with similar baked items as deep frying carries higher risk of accumulating trans-fatty acids. Added sugar and salt need to be minimized as food items naturally include them. Extra sugar and salt could lead to obesity and diseases such as diabetes and hypertension.

### 2.4 Other tips for a healthy diet

- Prevent buying meals from outside on a regular basis (meal outings should be coincided with dinner or lunch and they should not be more than a day or two times per month)





- In between meals give fruits instead of sugary/oily snacks. Eating a wide variety of fruits and vegetables regularly reduces the risk of obesity, diabetes, coronary heart diseases and cancers. At least five portions (preferably from 5 varieties) of fruits and vegetables are recommended for each day.
- Give water to quench the thirst instead of fizzy drinks (with or without sugar)
- Do not stock unwanted snacks at home.
- All members should adhere to these ground rules in the household.





### 3. Promote physical activity

Regular physical activity is vital for a healthy life. Each child should engage in a minimum of 60 minutes of activity each day, every day of the week. Those who are obese, should have a minimum of 2 hours of physical activity

Both children and parents should be adequately educated on the importance of physical activity. In the past people fulfilled the need of physical activity through daily activities. However, today the opportunities are less and some parents take it for granted and do not consider it as an important component of daily life.

It is beneficial for the whole family to engage in physical activity together. Engaging in daily activities will help in the burning of calories. Therefore, at every possible occasion people should engage in more activities with minimal use of automation (such as taking stairs instead of using the lift or escalator, walking short distances instead of using a vehicle). These normal life style activities consider as Base line activities. However, although such activities will help to burn calories, they will not help in improving the cardio-vascular health and cardio-respiratory endurance. Which is known as health enhancing physical activity. These would be achieved only when one engages in vigorous activity sufficient to increase the heart rate atleast by about 20% from baseline with an increase in blood pressure. Maintaining such activity over atleast 20 minutes is important.



### 4. Reduce sedentary activities

Sedentary behaviours are defined by both the posture and amount of energy expenditure i.e. Sitting or reclining, with low energy expenditure for a prolonged period. It is an independent risk factor for obesity. Examples of sedentary behavior include; watching television, using mobile phones, using computer etc.

“Sedentary lifestyle could very well be among the ten leading causes of death and disability in the world. Approximately nearly two-thirds of children are also insufficiently active, with serious implications for their future health”- The World Health Organization warned on the World Health Day in 2002 (WHO, 2011).





Studies of sedentary behavior typically record the pattern of behavior according to the following three domains (Healy et al., 2011).

- Estimates of total time spent on sedentary activity across the day or week
- Estimate of total time spent on sedentary behaviour during a specific time period of day (e.g. out of school hours, transport, work, leisure)
- Time spent on specific activities, used as surrogate markers of sedentary behaviours (e.g. television viewing, screen time - computers, internet, DVD/Video)

**Baseline activity refers to are normal lifestyle activities which are of the light-intensity**

**Light Intensity (<3 METs)**

- Walking slowly around home, store, or office
- Sitting - using computer, work at desk, using light hand tools.
- Standing performing light work, such as making bed, washing dishes, ironing, preparing food,
- Arts and crafts, playing cards
- Fishing sitting
- Playing most musical Instruments

## **Health-enhancing physical activity is activities which are moderate - vigorous Intensity**

### **Moderate Intensity (3 - <6 METs)**

- Walking at very brisk pace
- Cleaning heavy, Washing windows, car, clean garage
- Sweeping floors or carpet, vacuuming, mopping
- Carpentry - Carrying and stacking wood
- Trimming Grass land
- Badminton recreational, Volleyball noncompetitive, Basketball - shooting around, Table tennis, Tennis doubles
- Fishing from riverbank and Walking, Sailing boat

### **Vigorous (<6 METs)**

- Walking at very brisk pace, jogging and running
- Rock climbing at steep grades
- Throwing sand, Carrying heavy loads, such as bricks
- Heavy farming, such as bailing hay, digging ditches
- Leisure time and sports Bicycling on flat
- Basketball game Soccer, Swimming leisurely, Tennis singles, Volleyball - competitive at gym or beach

### **Recommendation for engage in physical activity**

Children 5 - 10 Years

- Children aged 5 - 10 years should accumulate at least 60 minutes (1 hour) or more of moderate-vigorous intensity physical activity daily, including activities that strengthen muscle and bone at least 3 days per week.
- Children 11 - 19 Years.
- For health benefits, adolescents aged 11 - 19 years should accumulate at least 60 minutes of moderate - vigorous intensity physical activity daily. Including Activities that strengthen muscle and bone at least 3 days per week and flexibility maintaining activities five days per week.
- Daily physical activity provides greater health benefits.
- Moderately-intense physical activities such as playground activities, bike riding will cause children to sweat a little and to breathe harder.
- Vigorous - intensity physical activities such as Running, Group games like Soccer, Basketball, Netball, Volleyball etc. Will cause children to sweat and be 'out of breath'.

## **5. Draw policies to promote health, nutrition and physical activity for school age children.**

Evidence from many studies indicates that consuming unhealthy food; especially those foods high in sugar and fat are positively associated with overweight and obesity in children (WHO, 2010). Therefore, guidelines should aim at improving consumption of healthy food and preventing consumption of food items with high sugar, salt and fat.

• **Few points to consider in developing policies include:**

- Schools are the main environment that children live and develop a lot of habits next to the home. This is the first diverse environment that they get exposed to with varied degree of freedom. Therefore steps have to be taken to improve that environment.
- If the environment is obesogenic, children will take up unhealthy behaviours despite their knowledge.
- Adequate room, facilities and opportunities should be provided to engage in physical activity'



- Ensure that healthy food, snacks and clean water are available within the school premises.
- Trade agreements and agricultural policies should be favorable to reduce the prices of healthy food.
- Provide time to have breakfast for those who have not had it at home before coming to school.
- Provide practical menus for snacks to be used with constant supervision.
- Refrain from using unhealthy food promotional material within schools or during school events held outside the school premises.
- Improve sanitary facilities within the school.
- Tighten the monitoring and regulation within the school on use of alcohol or any other illicit substances. Ensure that they are not available within close proximity.
- Do not offer food as rewards; instead offer a toy or a book.
- Provide a legal back ground to act against school canteens and food selling outlets around the school that sell unhealthy food.
- Encourage health promoting school concept.



# The ideal canteen based on recommended guidelines

## Chapter 06

Availability and affordability of unhealthy food items could be controlled through the school canteen policy.

The guidelines mentioned below are based on Food Based Dietary Guideline (Ministry of Health) and school canteen circular & policy (Ministry of Education).



### Main meals:

1. Fiber rich food items such as rice and other whole cereal products, pulses, tubers, yams and legumes to be made available daily through school canteens and school meals.
2. Different healthy food menus must be available at the school canteen every day.
3. Availability of white bread and other refined wheat products such as buns to be discouraged within the school premises.
4. Adequate amount of green vegetables and green leaves to be included into main meals at school canteens and school meals.



- Both animal origin and vegetable origin protein rich food items to be included into main meals at school canteens and school meals. (Vegetarian only options are also to be made available).
- Availability of oily rice such as fried rice and Biryani to be limited maximum to a day per week within school premise



### Snacks

- Boiled gram, pulses and vegetables are also recommended.
- Fresh vegetable and fruits salads to be made available through school canteens as snacks without sugar.
- Fresh fruits should be promoted rather than fruit juices in school premises.
- Yoghurt and curd to be made available through school canteens
- Oily nuts should be available in school canteen
- Deep fried food items to be prohibited in school premises unless for a special event
- Baked food items could be used as an alternative for deep fried food items.

### Beverage

- Clean drinking water must be freely available
- Fresh milk must be promoted as a snack but not as a main meal
- Healthy drinking options mentioned below to be made available at school canteens
  - king coconut, fresh fruit juice
  - Tea coffee without added sugar
  - Soup
  - kola kanda, belimal





## **Foods to be prohibited with in school premises (unless in a special event)**

### **Foods with high in sugar/ salt / fat**

- Donuts
- Eclairs
- Biscuits
- Chocolate Cake, Icing Cake
- Chocolate biscuit pudding
- Sweets like Boondi with high sugar content
- Ice packet & Icy Bars
- MalTED & chocolate Drink



### **Foods with taste enhancers such as Mono Sodium Glutamate, Sodium Inosinate**

- Salted peanut
- Pickle (packed)
- Soup cubes and instant soup mixtures
- precooked instant noodles
- other salted snacks



### **Drinks**

- Energy drinks
- Carbonated drinks



### **Foods with empty calories**

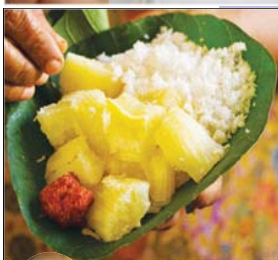
- Kisses
- Bombai Motai
- Bulto, Jujubs, Toffee, Chewing gum
- lollipops
- Jelly cups



### **Processed food**

- instant noodles
- sausages
- Meatballs

**Any Food or drink that is labeled with red colour circle is prohibited to sell in the school canteen**



## Recommended Healthy menus of snacks for school canteens

- Chick pea/cow pea tempered with onions and small pieces of coconut.
- Egg holders with maldivian fish sambol
- Wraps made with wheat. Filling: a mixture of meat, fish, eggs, tomato and salad leaves
- Those made with Ulundi mix served with a mixed vegetable filling
- Whole grain bread sandwiches with spread of cucumber tomato salad leaves with chicken or fish
- Kurakkan or whole wheat flour waffles and fruits such as mangoes, pineapple
- Poshana roti made with wheat, coconut, vegetables and green leaves with a cream and fish paste as spread
- Idly made with a mixture of vegetables and oats served with fish curry
- Fried rice with vegetables, fish /meat/eggs/vegetables served with dhal salsa made up of tomato
- Tempered noodles with vegetables, mushrooms/ fish/ meat/ eggs (non processed noodles)
- Fruit bowl
- Baked cutlets/rolls/patties/ with a filling of fish/meat/and fiber from polos or kohila
- Nuts roasted: ground nuts, cashew nuts without added sugar or salt
- Parippu wade with added green leaves air fried
- Ulundu wade with green leaves in the mixture
- Pancakes with filling of dried fruits
- Potato chips air fried without salt served with fish
- Fruit Salad served with yoghurt or curd with fruit
- Sago pudding in cups



### Sweet Meats

- Thala aluwa
- Thala guli
- Rulan aluwa
- Halapa with wheat and kurakkan
- Bath guli (dried rice)

### Beverages

- Kola kenda with juggery
- Fresh fruit juice without sugar
- King coconut water
- Beli mal drink
- Ranawara drink
- Fresh milk with no sugar



# Physical Fitness for a healthy life

## Chapter

# 07

Everybody expect a healthy life. For that one should be both physically and psychosocially healthy. Maintaining proper physical fitness directly influence the mental social and spiritual well-being.

To have proper physical fitness, not only nutrition but also adequate physical exercise is equally important.

Today non communicable disease has become a challenge and main reason for that is wrong food habits and sedentary life styles due to development of technology.



### Physical fitness

We are compelled to do certain activities in day today life. Therefore it is necessary to be physically fit to perform them efficiently. Physical fitness is the ability to perform physical activities successfully. Each person should have the certain qualities which can be developed by engage in physical activities routinely.

### Physical fitness

- Health Related Fitness
- Skill Related Fitness

Maintaining the above 2 in good status will lead to healthy life style.

### Health Related Fitness

To maintain the factors that directly affects the day today health status of a person.

There are several factors that improve health status

1. Fitness related to heart and lungs
2. Endurance of muscles
3. Flexibility
4. Resilience
5. body composition

The above health related factors of fitness can be improved by engage in exercise and games.

## 1. Heart and Lung related fitness

Capability of supplying optimal amount of oxygen requirement during an activity.

To improve this it is essential to engage in aerobic exercises. Following are the examples

- Brisk walking
- Slow running
- Swimming
- Cycling
- Aerobic dancing

Other than that can engage in game activities

- Eg.:
- Foot Ball
  - Volley ball
  - Badminton
  - Basket ball
  - Net ball



It is recommended for an adult to engage in the one of above exercises for 30 minutes time in 3-5 day /week, Whereas the duration can be extended for hour for and addescent in order to improve the fitness related to heart & lungs.

### Aerobic exercise

- Improve blood supply to the muscles from the heart and thereby the more oxygen supply and the nutrient absorption. Also increases vasculature and mitochondria at cellular level facilitating energy production at cellular level.
- Strengthen the heart muscles and there by improve cardiac output.
- Improve gaseous exchange process at lungs.
- Increases hemoglobin status in red cells.
- Exercises will burn unhealthy fat(LDL) and increase the healthy fat(HDL).
- Control blood pressure.
- Increase blood supply to the brain.
- Increase endorphins hormone secretion resulting a happy mood.

Therefore by doing aerobic exercises your body weight might reduce resulting “stunning appearance” which in turn “relax your mind”. High metabolic rate at cellular level increases efficiency and person can work without much exertion .This improves your satisfaction in day today life and also the risk of non-communicable disease burden by reducing complications related to heart and lungs.

## 2. Muscle power and endurance

Muscle power is the power of a single muscle or group of muscle will produce against the external resistance.

Muscle endurance is the ability of the muscle or group of muscles to continue the activity without being exhausted.

Everyone should have the ability to engage in age appropriate day today activities without getting exhausted. Therefore it is important to engage in the exercises improving muscle power and the muscle endurance regularly. Exercises can be perform either “against the external resistance” or “using body weight”.

- **External resistance:-**

The weight for the external resistance should be selected age appropriately as the body is not biologically matured enough to act against the 100% of the external resistance until the 17 years of age. Therefore children should engage in these activities under the guidance of a trained coach either at school or the gymnasium.

Recommended weight for the age

Age 14-17 years - 50% of a 1RM (One Repetition Maximum)

>17 years – 100% of a 1RM (One Repetition Maximum)

- **Body weight as the resistance**

The exercises that can perform using the body weight as the External resistance

1. **Push ups -**

lying horizontally in prone position with hands stretched and body moved up and down that strengthen the muscles of the hands.



2. **Chain ups -**

cling on to a bar and move the body up and down. - To strengthen the muscles of the upper arm.



3. **Sit ups –**

lying on the floor in supine position and bring the heel towards buttocks Raise the body up and down - To strengthen the abdominal muscles.







#### 4. Squat –

stand straight keep legs apart and stretched the arms forward. Move the trunk of the body up and down-To strengthen the leg muscles.

Also can use free weight equipments.

- Dumb bells
- Medicine balls
- Rubber bands



It would be helpful to use free weight equipments rather than machines. This helps not only to strengthen the muscles but also to maintain the body balance.

Exercises that are done by equipment

- Bench press
- Leg press



1. Bench Press



2. Leg Press

**Frequency and intensity of the resistance exercise** will result in the varying degree of muscle power and muscles endurance.

### **Selecting suitable exercises for endurance**

If you are selecting exercises for improve general fitness it is necessary to select exercises for all muscle groups of the body including front and the back of the body. It is essential to practice these exercises 2-3 days a week.

To minimize injuries during endurance exercise should adhere to the following instructions.

1. Get advice from a trained instructor
2. Warm-up exercises and stretching excercises should proceed each session.
3. Always use the correct posture.
4. Use appropriate sports ware (including protective shoes) during exercises.
5. Always maintain the balance during exercises
6. Having a good Knowledge on the mechanism of the equipment you are using for the exercises.

Advantages of improving muscle power and endurance.

1. Increases the muscle size, power and the endurance.
2. Strengthening the bone by improve bone mineralization.
3. Strengthen the joints and ligaments.
4. Increase the stored energy in muscels.
5. Reduce the risk of non-communicable diseases by controlling sugar and blood pressure.
6. Creates pleasant appearance due to growth of muscle mass and burning of excessively deposited fat.

## **Flexibility**

Flexibility is the range of movements that a joint would be able to perform which is very important in day today activities

### **Exercises that improves flexibility**

Need to practice both static and dynamic exercises representing all the muscles and the joints of the body.

#### **Static flexing exercises**

- Bending neck side ways
- Stretching arms upwards
- Stretching the body side by side with raised hands.
- Bending forward and touch the floor without bending legs
- Stretching forward towards the leg kept forward.

#### **Dynamic flexing exercises**

Various types of other exercises that improves flexibility

- Yogi exercises
- Gymnastics
- Swimming
- Begley dancing

Advantages of flexibility of the body

- Attain maximum range of movement
- Minimize joint disorders
- Maintain balance of the body
- Maintain body posture

## **Body Composition**

The Human body consists of fat, protein, minerals and water, This is called the body composition. It consists of 2 major categories.

1. Body fat
2. Fat free mass

**Body fat** - The amount of fat deposited in the tissues of the body.

**Fat free mass** - Includes the muscles, bones, organs, tissues, skin and the water content of the body.

The fat content of a healthy person is expressed as a percentage of body weight. It is typically a 20% - 25% for male and 30% - 35% for female. Maintaining fat percentage of the body within the limits is utmost important to prevent non communicable diseases in later life.

### Healthy tips for maintain body composition

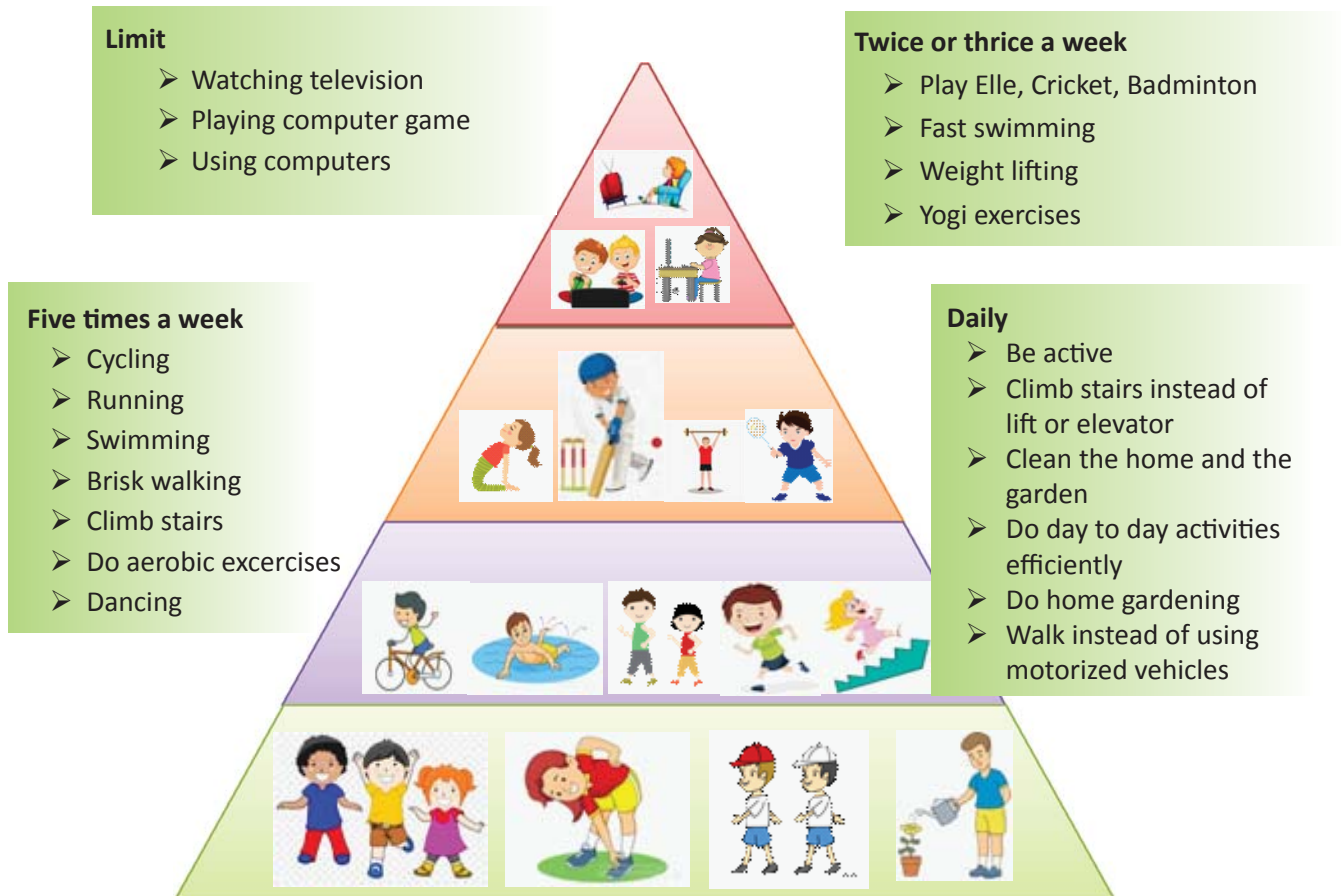
1. Take a balance diet.
2. Minimize food containing high sugar, salt and fat.
3. Involve in physical activity at least 60 minutes a day.
4. Refrain from slcohol, drugs and smoking.
5. Sleep adequately.
6. Minimize using machinery equipment for day today activities.
7. Do daily activities effeciently.

### Benefits of maintaining the body composition

1. Being healthy.
2. Being efficient.
3. Minimize the disability.
4. Minimize non communicable diseases.
5. Good physical appearance

### Physical Activity Pyramid

A guide for the type of exercises and the frequency.



## **Factors you should consider when doing exercises**

We all expect to improve our health and physical fitness by doing regular exercises. Nevertheless they may result in various injuries of muscles and joints. Therefore it is necessary to be prepared before hand to minimize such injuries and the nasty outcomes by adhering to the following steps.

### **1. Involve in warming up exercises**

Everyone has to do body warming up exercises before physical exertion or perform an event. This exemplifies adequate blood supply to the muscle tissue, relaxing and stimulate muscle tissue.

### **2. Cooling down exercises**

Vigorous Exercise or sport event should be terminate with the cooling down exercises to get your body back in to the gear. These exercises should be select according to the activity or event performed.

Eg:- Vigorous running exercise can be followed by 5 - 15 minute gentle running as a cool down exercise this lead the heart rate back to the basal level.

Static stretching exercises should be followed by stretching exercises which result in relaxation of the muscles improving blood supply to the muscles. This facilitates reconstruction of minor injuries by excreting the waste products and providing energy and nutrition for the growth of th musculature.

### **3. Personal need and the age**

Age, weight of the body, current medical illnesses, disabilities and the physical fitness should take into account before selecting the type of exercises. People with chronic illness should select the exercises according to the medical advice.

### **4. Food**

Diet should be planned according to the target.

Eg:- If some one is planning to reduce the body weight by doing exercises it is necessary to take low fat, low carbohydrate diet following exercises. Otherwise food rich with carbohydrate and proteins is recomended, to compansate the energy loss.

Drinking water is very important while engage in exercises for fitness of the body. It is recommended to drink water frequently before feeling thirsty during the exercises for body fitness.

### **5. Shoes and Garments**

Factors you should consider when selecting Shoes and Garments.

#### **Garments**

- should be selected according to the type of exercises.
- should not interfere with body movements while doing exercises.
- Have to be well-groomed and ventilated.
- Should not contain pieces of Iron hooks and metal parts which damage the body due to friction.
- Preferably in white or light colour which suit to the warm environmnet.

#### **Shoes**

- Must be comfortable and contain cushions for the tendon achilis.
- Should not be tight allowing toes to their full movement.
- Sole should not be slippery.



## 6. The environment

Should be calm and secure especially for an ill patient.

Ideal time is the morning. This provides a fascinating environment due to low temperature. Ventilation should be adequate.

Ground should be even and free of thorns, stones and holes.

### How to engage in physical activity a child with overweight or obese

It is difficult for an obese child to engage in physical activity for long hours. This happens as they have a thick fat coat and that prevents their body getting cooler after physical activity. So they feel tired very soon.

At the beginning of engaging in physical activity, obese children may feel tired very soon and they will not be able to engage in one hour of physical activity continuously. However, parents should not stop but guide them to take small breaks, let them to take some water and continue the activity and the session should continue for one whole hour though they may not actively engage in the exercise throughout the whole minutes. After 10-15 minutes of activity when child gets tired let him/her to take a break for about 5-10 minutes and then recommence the activity. Once they continue to do for some time and they will be able to gain endurance and finally should be able to engage in full 60 minutes or even more.



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This is called the body composition

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### **Healthy tips for maintain body composition**

1. Take a balance diet.
2. Minimize food containing high sugar, salt and fat.
3. Involve in physical activity at least 60 minutes a day.
4. Refrain from alcohol, drugs and smoking
5. Sleep adequately.
6. Minimize using machinery equipment for day today activities.
7. Do daily activities efficiently.

### **Benefits of maintaining the body composition**

1. Be healthy.
2. Be efficient.
3. Minimize the disability.
4. Minimize non communicable diseases.
5. Good physical appearance.

# Contribution by the Ministry of Education to minimize the nutritional problems

## Chapter 08

**There is a direct connection between educational performance and the nutritional status of the school children. The fundamental objective of Ministry of Education is, to ensure all the children would achieve essential learning skills in primary education and to acquire adequate qualification to enter the higher education in secondary stage. Therefore following programmes are carrying out targeting healthy active younger generation in future'**

### 1. Provision of school meal for students

- It is expected to increase the percentage of students with optimum nutritional status. Other than the schools where government funded meal is provided, healthy meal is provided at school level with the help of parents' participation. Healthy food menus with vegetables, fruits and lentils has been introduced in spite of unhealthy food practices. Compulsory to allocate 15 minutes has been allocated for the school meal.
2. Implementation of policies for selling and maintaining food in the school canteen. It is prohibited to sell the food containing high content of sugar, salt and oil according to the canteen circular 2015/35 & canteen policy guide. In addition to that, effects of unhealthy food and mal practices in dietary habits have been in cooperated to the school curriculum.
  3. Twenty minutes of compulsory period has been allocated for the fitness exercise early morning. It has been introduced game related play activities for the primary section and aerobic exercises for the secondary section age appropriately.
  4. A set of exercises "Healthy Kids" has been introduced for the primary section providing more time for the outdoor activities.
  5. Empower children to know about their own nutritional status to overcome the nutritional problems. The knowledge is given in the "environment all studies" subject in primary section and "health and physical education" subject in secondary section.
  6. Doing activities to Minimize nutritional problems under the health promoting school programme will up lift the nutritional status of school children.

# Prevention of obesity among differently abled children and child athletes

## Chapter 09

**It has been identified two group of children who are prone to develop overweight/obesity This chapter describes the special dietary patterns and the physical exercises for these children.**

### 1. Differently able children

### 2. Child athlete

#### **Differently able children**

Congenitally disabled children and disabled in later life due to chronic disease conditions are included in to this group.

### **causes for obesity & over weight among differently abled children**

#### **1. Excessive food intake**

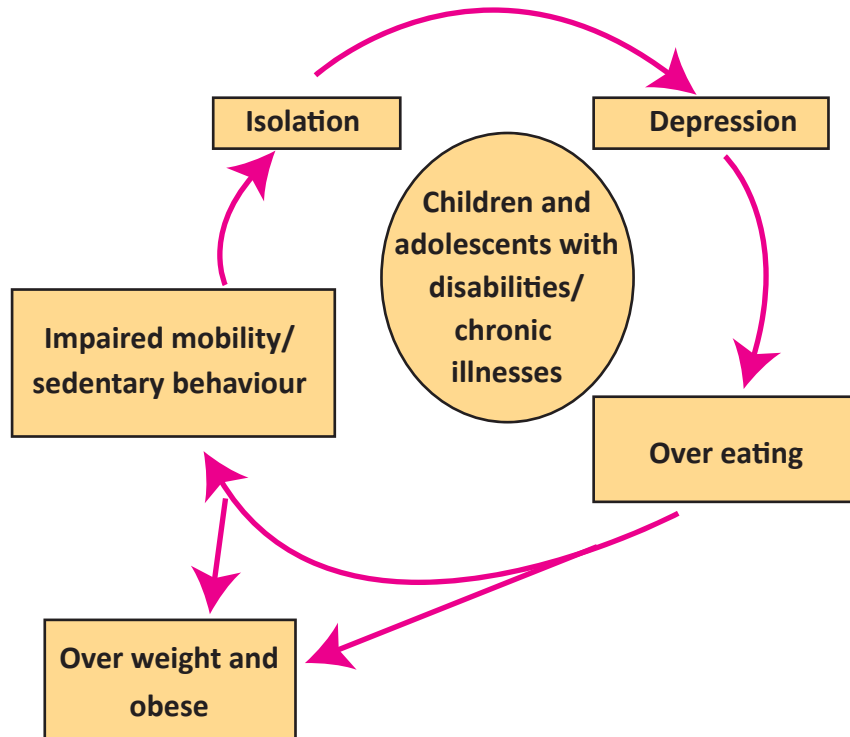
- Some children with disabilities have feeding and swallowing issues and tend to be on tube feeds. Such patients have higher risk of getting high calorie blended feeds.
- Children with Prader-Willi syndrome, craniopharyngioma, Down's syndrome or spina bifida have a predisposition to overeat.
- Parents tend to offer their disabled children more sweets to calm down the children and to keep them happy.
- Frequent food consumption as a consolation for sadness, boredom, or loneliness can be seen.
- Some children with disabilities have a different body composition and their BMI may not reflect the body fat proportion accurately.

#### **2. Lack of physical Activity**

- Restriction of participating in sports or recreational sports with healthy children.
- Coordination difficulties due to physical, sensory or cognitive deficits in disabled children.
- Restriction due to Pain and joint contractures.
- Lack of availability of facilities for disabled people in all settings.
- Over protective parents and unsafe neighborhood.
- Diffrenties due to Financial expenses foe special equipment.
- Risk of cardiorascular complications due to underlying syndrome pathology
- Immerse Fatigue.
- Pain owing to the strain on joints and muscles.

## 2. Sedentary Life Style

Physical, sensory and cognitive deficits of these children will lead to sedentary behaviour where as parents also tend to promote computer games and the television as the easy and safe way of caring them.



### Remedial Measures that can be taken to prevent overweight on a obesity



- Low fat and low sugar diet should be worked out with the parents.
- Attention should be paid to the portion size and calorie content when giving blended food
- Sweets should be replaced by fruits
- Increase the consumption of vegetables which will not only reduce obesity but also will help in bowel motions as it is a considerable concern in children with disability
- Promote physical exercise. The plan has to be individualized depending on the degree and type of disability. Physical activity improves muscular strength, physical fitness and reduces; osteoporosis, bone fractures as well as dependence on others.



- Recognize the barriers to exercise and healthy diet and explain these to the children and their families
- Support the families in creating appropriate exercise options/regimens
- Provide psychological support for children who are depressed
- Reduce the time spent on computer games, television & suggest alternatives for them.
- Have multidisciplinary approach together with the dietician, speech therapist and physiotherapist to provide individualized care.

### Physical activities for a differently able child



10 dives



20 chest  
expansions



20 overhead  
punches



10 raised arm circles  
5 clock wise/ 5 counter clock  
wise



20 side arm raises



20 punches

### 5.2.2 Prevention of obesity in a child athlete

Proper nutrition is vital for child athlete to attain optimal growth and perform well in sports. A well –balanced diet containing appropriate amounts of macronutrients (carbohydrate, protein and fat) and micronutrients (vitamins and minerals) is needed to supply sufficient energy for growth and activity. Also, fluids are vital for hydration to support growth and athletic performance. Proper nutrition improves sports performance by decreasing fatigue and the risk of sports injuries. It also empowers sports personnel to accomplish optimized training and faster recovery.

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Macro nutrients	% total caloric intake		storage	Food items	Function
Carbohydrate	45% - 65%		Glucose stored as glycogen in muscles and liver.	Grains (rice, wheat) Yams (potato, manioc) Fruits, vegetables	Readily available energy source
Protein	10% - 30%			Meat, poultry, fish, egg dairy products	Build and repair muscles
Fat	25% - 35%	<10% saturated fat (unhealthy)		Candies, chips, deep fried items, bakery products	Absorb fat soluble vitamins, provide essential fatty acids Protect organs and insulation
		>25% Un-saturated fat (unhealthy)		Fats, nuts, seeds, dairy products, olive oil, coconut oil	

- Child athlete should minimize food items, which are rich in simple carbohydrates (sweets, sugar rich desserts, sports drinks etc.) to prevent obesity as well as dental decays.
- Unhealthy fat from candies, chips, deep fried items and bakery products should be minimized to prevent child obesity.
- Since three major macronutrients contribute for energy in sports, it is not healthy to cut down food items which contain those nutrients drastically. If such food items are significantly reduced, performance will be severely affected.

Macro nutrients	Daily Requirement		Food items		Function	
Calcium	4-8 year old -1000mg/day 9-18 year old - 1300mg/day		Small fish varieties, milk and milk products,green leaves(katurumurunga, koorathampala)		Bone health,muscle contraction, normal enzyme activity	
Vitamin D	600IU/day		Fortified food such as milk and exposure to sunlight		Bone health, Absorption and regulation of Calcium	
Iron	9-13 year	8mg/day	Animal liver, lean meat,fortified whole grains and leafy vegetables		Oxygen delivery to body tissues	
	14-18 year	boys - up to 11mg/day				
	14-18 year	girls - up to 15mg/day				
Fluids	Before	Training or event	400 ml to 600 ml (2-3 cups) of water 2-3 hours before	water		Regulate body temperature and replace sweat losses (fluids and electrolytes) during exercise
				Lasting < 1hr	Lasting >1hr/hot /humid weather	
	During		150 ml to 300 ml of fluid every 15 min to 20 min intervals.	water	Water+Carbohydrates as solids or liquids Banana, watermelon, dried fruits(dates), “Jeewani” in half strength	
	After		If you lost 1kg body weight you will need to drink 1250-1500 ml fluid over the next 2-6 hours.	sodium containing fluids and snacks		

Although there are many vitamins and minerals required for good health, special attention should be given to ensure the athletes consuming proper amounts of Calcium, Vitamin D and iron.

Fluids, especially water, are vital for child athlete. Athletic performance can be affected by what, how much and when an athlete drinks. Dehydration can decline performance and makes athletes at risk for heat stroke. Well planned hydration strategies include adequate fluid intake, before, during and after the event or a training session.

## General guidelines

- Consuming heavy meals a minimum of 3 hours before an event or a training session to allow proper digestion and to minimize incidence of gastrointestinal discomfort during workouts.
- Pre training / event meals or snacks should be rich in carbohydrates (complex carbohydrates i.e.unprocessed starchy items) with medium/low glycemic index. Snacks rich in simple carbohydrates such as sweets, fizzy drinks, and glucose should not be consumed just before training.
- In addition to carbohydrates, moderate amount of protein should be included in pre training meals.
- Fat and fiber should be limited in pre-training meals. Specially, high fat meals should be avoided before a training session or an event because they can delay gastric emptying, make athletes feel sluggish and thereby adversely affect performance.
- For early morning practices or events, consuming a snack or liquid meal 1 hour to 2 hours before training. This should be followed by a full balanced breakfast after the workout. This will help to ensure sufficient energy to maximize performance.

<b>Pre event</b>	Meals minimum of 3 hours before and snacks 1-2 hours before activity	Snacks or liquid meals, fresh fruits, dried fruit, a bowl of cereals with milk, fresh fruit juice or fruit based smoothies.	To allow digestion before starting exercise
<b>During event</b>	For exercises > 60 minutes	fruit or cereal bars	Help to refuel and to keep energy levels high.
<b>Recovery</b>	Within 30 minutes after ending the exercises and again within 1 hour to 2 hour of activity	Should include carbohydrate and protein. Milk, milk products such as yogurt, fruits, milk shake, fruit smoothies	Help reload muscles with glycogen and allow for proper recovery.



# Strategic framework - from policy to implementation

## Chapter 10

### Implementation status of reducing an obesogenic environment in schools – Sri Lanka

#### Strategic framework – from policy to implementation

Intervention	Leadership	Responsible for implementation	Monitoring	Implementation Status
Promote Walk to school concept	Ministry of Education	Education and Health and Public administration Road safety etc.	Surveys	Nearest school the best School concept
Curricular based physical activity made mandatory	Ministry of Education	Ministry of Health Ministry of Sports	School time allocations and surveys	Cabinet memorandum regarding prevention of obesity among school children suggestive of minimum of ½ hour PE time
Self-assessment of health risks (e.g. BMI)	Ministry of Education	School principals & School health leads	Data – real time once every 4 months?(during the first week of each term and reflect on previous recording)  Also to attach a BMI chart to the report or given as a separate card	Distribution of Height and weight measuring scales, BMI for age BMI charts, management charts
Nutrition education to be introduced as curricular change	Ministry of Education	School principals & School health leads Make health a mandatory core subject for O/L	Mandatory exam questions to be monitored/generat ed by MOH	

Intervention	Leadership	Responsible for implementation	Monitoring	Implementation Status
Canteen policy effective implementation of existing policy make sure only healthy food are available in the canteen.	Ministry of Education	School principals & School health leads	To be schools, PTA and data collated by MOH School health programme	
School health check to be extended to OL/pre AL age group Medical officer of health should allocate a date for school medical inspection & identify a suitable place for SMI in the school. All the class teachers should attend SMI. Follow up of the students identified with defects and report.	Ministry of Health Ministry of Education	School health leads	data collated by MOH School health programme	
School Health clubs to be enhanced via health promoting school concept	Ministry of Education	School principals & School health leads	To be schools, PTA and data collated by MOH School health programme	Accreditation of health promoting schools
Focus/prioritize on greater 'at risk' zones	Ministry of Education Ministry of Health Principals MOH	School principals & School health leads	Data generation GIS	

## Summary

1. Measurement of BMI and plotting of results on a BMI chart to track changes over time.
2. Routing assessment of all school children for obesity-related risk factors to allow for early intervention.
3. Family centered communication and interventions.
4. Implementing the a staged approach weight management.
  - a. Stage 1 – Prevention plus
    - i. Nutrition goal
      1. Encourage consumption of 5 or more servings of vegetables and fruits daily
      2. Minimised sugar, oil & salt
      3. Eat breakfast everyday
      4. Eat most meals at home and as a family
    - ii. Activity Goal
      1. Less than 2 hours of television or other screen time per day
      2. More than 1 hour of physical activity daily
    - iii. Behaviour intervention
      1. Reinforce goals at each school health visit by health team, or additional visit
      2. Allow child to self-regulate, avoid overtly strict eating regime
  - b. Stage 2 – Structured weight management – Referral
    - i. Daily eating plan, with scheduled meals and snacks – Give a portion base diet
    - ii. Emphasis foods with low energy density
    - iii. Reduce frequency and quantity of foods with high energy density
    - iv. Limit portion size

