

Guidelines for prevention of childhood obesity

Approach I: The right diet and nutrition

Children need lots of energy for their normal growth and well being. The energy contained in the food they eat is to be controlled to achieve or maintain a particular body weight. A varied and nutritious diet is essential for their development.



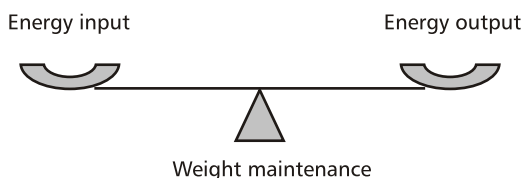
The increasing frequency of eating out at restaurants and eating food prepared outside the home has an influence on eating behavior. Eating at fast-food restaurants could be associated with excess weight gain because of the high

fat content of the foods. The most popular items are generally high in fat. For example, 3 pieces of Chicken65 has ~ 546 kcal and 31.7g of fat; a medium cutlet gives ~223 kcal and 17.7g of fat. Altogether, this meal has 769 kcal and 49.4 g of fat; about half the total recommended daily energy requirement based on a 1600-kcal diet.

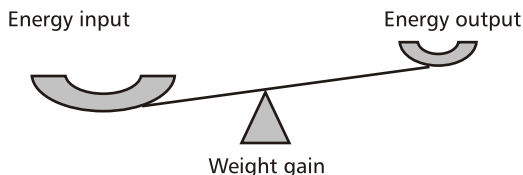
Why do we gain weight and how do we lose it?

Energy balance occurs when energy intake equals energy expenditure. Energy intake in excess of energy expenditure results in weight gain, whereas energy expenditure in excess of intake produces weight loss. The only discretionary elements of energy balance are food intake and the energy spent on activity. Your weight is a fine balance between the energy you burn off (the amount of physical activity) and the energy you consume (the food we eat).

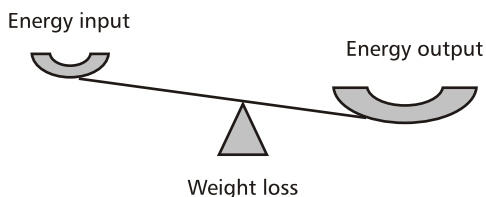
If your daily energy intake from food is the same as the calories your body needs each day, your weight will stay the same. In other words, your body will be in energy balance.



If your daily energy intake from food is more than the calories your body needs, your weight will increase. This is because your body will store the extra energy as fat. This is your body's way of protecting you against famine.



If food becomes scarce, the fat you have stored will provide your body with energy for quite some time.



What is the normal requirement of nutrients?

Recommended Dietary Allowance (RDA)

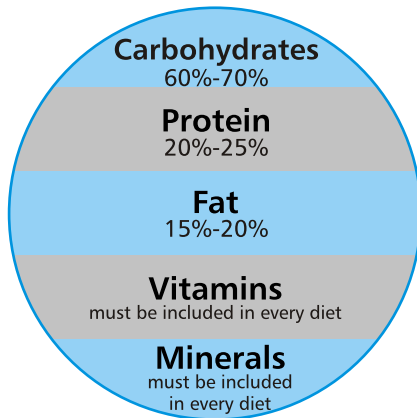
Group	Age (years)	Calories (Kcal)	Protein (g)	Fat (g)
Children	1-3	1240	22	25
	4-6	1690	30	25
	7-9	1950	41	25
Boys	10-12	2190	54	22
Girls	10-12	1970	57	22
Boys	13-15	2450	70	22
Girls	13-15	2060	65	22
Boys	16-18	2640	78	22
Girls	16-18	2060	63	22

Source: Gopalan C, Nutritive value of Indian foods; 2004;
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A diet high in nutrients is the key to good health. In order to maintain your body weight one should take a balanced diet.

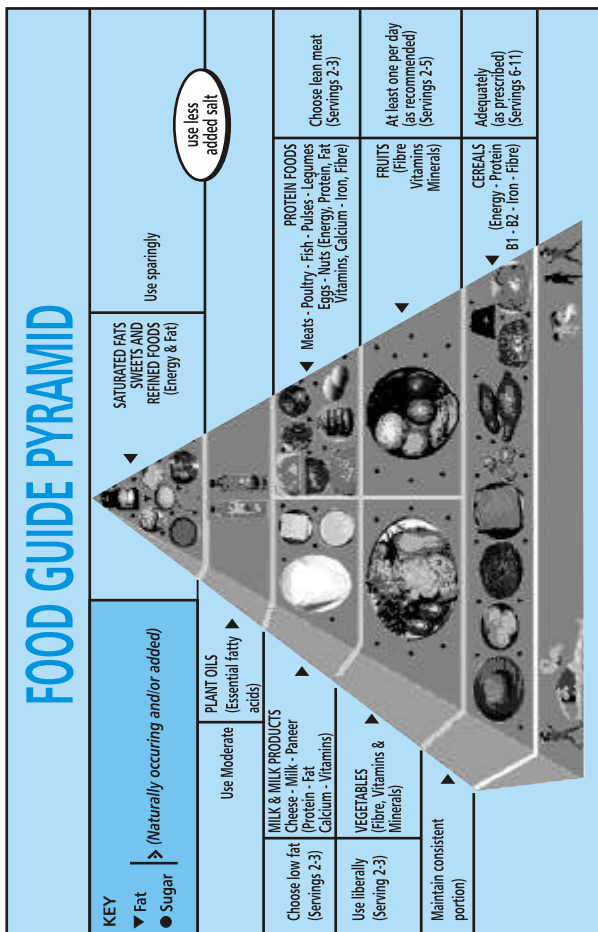
What is a balanced diet?

A diet which has all the nutrients such as carbohydrates, proteins, fats, vitamins, minerals in the right proportions is a balanced diet.

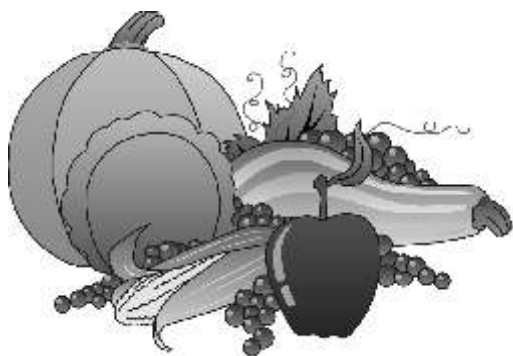


Food Guide Pyramid

The Food Guide Pyramid is a visual representation of the variety and proportion of foods that could be included in a day's diet. The different food groups are arranged in the form of a pyramid.



- The base of the pyramid contains **cereals and starches** which provide the major part of the day's energy. All cereals could be included, in their respective quantities prescribed for you. This group contributes carbohydrates to our body.
- The next level is shared by **fruits and vegetables**. Adequate intake of these provides antioxidants, vitamins, minerals and fibre. At least one fruit per day is recommended. About 500gm of vegetables (in any form like soup, salad etc) per day needs to be taken to meet the vitamins and minerals requirement.





- **Protein rich foods** - Vegetarian foods like, Legumes-dhal and wholegrams and Non-vegetarian foods like fish / chicken /egg and low fat milk / milk products form the next level. The quantity of these foods would vary for each individual.
- **Nuts and oils** form the fourth level in the pyramid. A handful of boiled/roasted nuts can be taken daily by children. For those who are overweight/ obese, nuts could be included occasionally by making adjustments in the fat consumption.
- The tip of the pyramid contains **sugar, saturated fat and refined foods** which could be taken sparingly. Oil intake should be limited to 25-30 ml/day. Oil consumption should be reduced for person with obesity.

Food Guide:

Types of food	Preferred	Avoid
Cereals	All whole grain cereals such as whole wheat, oats, ragi, millets brown rice etc.	Maida, polished rice, refined food products, instant foods.
Pulses	Dhals or grams with outer capsules (Skin), Sprouts	Fries such as vada, bonda
Vegetables	Vegetables rich in fiber like greens, brinjal, cauliflower, gourds, Salads	Frying, deep frying, pickle, dehydrating vegetables
Fruits	All fresh, frozen fruits and dry fruits	Canned, Bottled, Juice, Squashes
Dairy Products	Skimmed milk, Unsweetened yoghurt, curd, buttermilk	Cheese, ghee, ice cream, milk cream, Whole milk
Meat products	Fish, chicken, egg white – Boiled, steamed, grilled, roasted, barbecued or stewed	Red meat, organ meat, Egg yolk, frying and deep frying
Sugar and sweets	Tea, coffee, aerated drinks, soda Sugar, honey, jaggery 3-4 tsp a day	Sweets prepared with oil and vanaspathi
Oils	Olive, groundnut, sunflower, safflower, Gingelly oil – 25-30 ml/day	Palm oil, coconut oil, lard, vanaspathi, refined and processed oil
Beverages	Water, Buttermilk, Clear soups, Tender coconut water	Tea, coffee, aerated drinks, soda

Water:

Drinking more water keeps your stomach full and suppresses the appetite which will reduce your food intake.

Fibre:

Foods rich in fibres are low in calories and gives fullness to your stomach easily. Foods like apple, strawberries, broccoli, cauliflower, lady's finger, brinjal, pineapple, papaya are rich in fibres.

Good fats:

We need some Essential Fatty Acids (good fat) for our body for the normal metabolism. This fat will naturally reduce the bad fat in your body. People who consume fatty foods with no EFA will have a craving for oily foods and other junk foods. And children will get dry skin, hair fall etc, if they don't take enough of EFA in their diet. Fish, walnuts, pistachio, flax seeds, pumpkin seeds, soyabean, canola oil, and cotton seed oil are the richest source of essential fatty acids.

Here is an example of an unhealthy diet and how to replace it with a healthy one!!!

Unhealthy diet	Dietitian's recommendation
Morning:	
Full Cream Milk 6% fat with Complian 4 tsp and Sugar 2 tsp (or) Fruit Juices with Sugar – 2 glasses (350 kcal)	Idly-3 (or) Dosa-2 (or) Roti-3 (or) Poha (Rice flakes)-2 cups (or) Chapathies -3 (or) Bread -3 slices with Chutneys/ Dhal -1 cup Vegetables-1 cup Milk-1 cup (350 Kcal)
Mid Morning:	
Cream Biscuit 1 packet (or) Chocolate Biscuit 1 packet (500 kcal)	Roasted / Boiled Sprouted Gram -1/2 cup / Roasted Nuts like Groundnut - 25 gms / Fruit – 1 (or) 2 – 100 gms. / Veg Sandwich -2 / Biscuits – 3(or)4 (100 Kcal)
Lunch:	
Noodles with Non-veg (Chicken or Fish Fry) Potato Chips (500 kcal)	Rice – 2 cups / Phulka Roti -4 / Rice-1cup + 2 Roti Dhal (or) Whole Grams (or) Sambar -1 cup (or) Non-veg dish like Chicken / Fish -2 pieces (100 gms) (or) Egg-1 Vegetables – 1 cup (or) Greens – 1 cup (450 Kcal)

Evening snack:	
Pizza (or) Burger (or) Cakes (or) Masala Dosa (or) Samosa (or) Savouries. (300 kcal)	Dosa 1 (or) 2 / Veg Sandwich -2 / Masala Puffed Rice with Roasted Grams / Pizza with less Cheese and more vegetables / Veg Cutlet -1 (or) 2 / Idli Upma / Noodles with veg/pop corn -2 cups (200 K Cal)
Late Evening:	
Chocolates (or) Cool Drinks (or) Lays, Kurkure (or) Fried Nuts. (200 kcal)	Soup – 1 cup / Fruit 1 (or)2 / Tomato Juice (50 Kcal)
Dinner:	
Alu Parathas, Poori with Paneer Masala (or) Biryani with Non-veg gravy Ice Cream-2 cups (or) Desert 2 cup (or) Pudding – 2 cup (or) Chocolate Milk with sugar- 1 glass (500 kcal)	Same as Lunch Ice Cream / Desert/ Pudding – ½ cup (or) Milk -1 cup (or) Fruit Salad (500 Kcal)
Added fat kcal - 270 calories Total calorie intake per day: 2620 kcal	Added Fat kcal 20 ml – 180 Calories Total Calorie Intake Per Day: 1830 Kcal

Or... choose a healthy diet yourself!!!



Enemies	Friends
Pasta	Whole wheat pasta
Noodles	Sphagetti, Macaroni
White bread	Brown bread/multigrain bread
Maida(Paratha)	Whole wheat(roti)
Polished rice	Brown/Red rice
Vadas/bondas	Momos
Fried cutlet	Cutlets cooked in microwave oven
Whole milk	Skim milk
Ice cream	Frozen yoghurt with fruits
Creamed soup	Veg clear soups
Cookies	Ginger slab, fig bars
Mayonnaise	Mustard
Cake(chocolate, madeira)	Cake(angel form, with egg white, plum)
Sauces (tomato, ketchup)	Chutneysmade of onion, ginger, tomato, mint and other herbs
Cream biscuits	Plain biscuits
Fried fish	Baked or grilled fish
Chicken fry	Tandoori chicken or chicken tikka

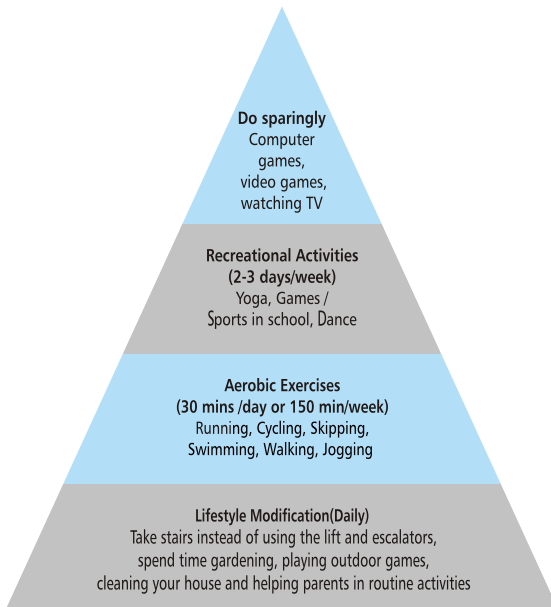


Enemies	Friends
Paneer butter masala	Paneer tikka
Mushroom masala	Mushroom stir fry
Egg omlette	Boiled egg white
Aerated drinks	Fresh fruit juice
Fruit juices	Fresh fruits
Chips	Plain pop corn/roasted fryums
Bombay toast	Toasted open sandwich
Fried papads	Roasted papads
Chocolate	Almond/pistachio bar

• *The treatment goal for the child who is overweight should be weight maintenance or a slowing of the rate of weight gain. (If the weight appropriate for the child's anticipated adult height has already been reached, then maintenance at that weight should be the lifetime goal.) Children should not be put on "diets" but should be taught to make healthy food choices. Increased physical activity is extremely important in weight management programmes for children. Inactivity usually coupled with excessive TV watching must be cut down in order for the child to eventually achieve the long-term weight goal.*

Approach – (II): Exercise and Increased physical activity

Regular exercise is the secret of a healthy mind and body. This pyramid shows the importance of exercise and lifestyle modification.



Exercise tips for those with Diabetes:

The role of exercise differs in Type 1 and Type 2 diabetes, but yet it definitely helps one to maintain normal and ideal body weight.

i) Exercise in Type 2 Diabetes:

Exercise can help to control the blood sugar levels in Type 2 diabetes and allows parents more flexibility in their dietary control. In type 2 diabetes, the physical activity is related both to obesity and to the central or abdominal distribution of fat. Lack of regular physical activity may also contribute to the development of insulin resistance either directly or through weight gain.

Regular physical activity when combined with dietary modification leads to more significant weight loss and may also help in long term weight maintenance. Weight loss is necessary to get the full benefits of blood sugar level control due to exercise. We need to exercise at least three to five times a week, with a gap of no more than 48 hrs. This can include brisk walking, jogging or running, swimming, bicycling, tennis, badminton, dancing etc.



Benefits of regular physical activity in Type 2 Diabetes

- | | |
|---|---|
| <ul style="list-style-type: none"> • Lowers blood glucose during and after exercise • Increases insulin sensitivity • Lowers basal and post prandial insulin levels • Lowers glycated a haemoglobin over long term • Lowers blood pressure | <ul style="list-style-type: none"> • Lowers triglycerides and LDL cholesterol, increases HDL cholesterol • Lowers plasma fibrinogen • Other benefits <ul style="list-style-type: none"> • Cardiovascular conditioning • Improves strength • Improves sense of well being • Better quality of life |
|---|---|

ii) Exercise and Type I Diabetes:

Exercise cannot be used to control blood sugar levels in Type 1 diabetes but plays an important role in reducing the insulin requirement of the individual. Exercise in children and young adults with type II Diabetes can frequently lead to hypoglycemia, a state produced by a lower than normal level of sugar in the blood. This can detract from the enjoyment of exercise and reduce the confidence to participate. But it need not be so. With a little care, education and organization, people with Type 1 diabetes can take part in any form of exercise. In fact regular exercise early in life can confer protection against vascular events in later life, lower cholesterol, increase insulin sensitivity and lead to reduction in insulin requirement.

Precautions to be taken during exercise in Type I diabetes

- Prevent hypoglycemia
 - Pre exercise blood sugar level should not be less than 126 mg/gL.
 - Pre exercise blood insulin level – greater the subcutaneous bolus injection taken before exercise greater the likelihood of hypoglycemia
 - Frequency and severity of hypoglycemia increase with duration and intensity of exercise.
 - Avoid exercising in hot and cold weather.
- Delayed hypoglycemia – This often occurs at night after sustained exercise during the day. So it is necessary to have a good snack and monitor blood glucose level before going to bed.

Foot care – Proper footwear with high quality hosiery to cushion the feet while exercising and regular foot examination are very important.

Approach - III: Psycho-social & educational method

Children the most precious asset of any nation, deserve the best care that mankind can offer. Opportunities need to be provided to foster full development of their potential. As the personality development takes place right from childhood through the influence of nature and nurture, a favorable environment (home, school and neighborhood) helps the child to possess good physical health and sound mind with highlighted traits of self-concept, self-direction, self-esteem, self-awareness, self-actualization, self-evaluation, self adjustment, self-confidence and self-competence etc.

Obese children suffer from a host of co-morbidities. Immediate effects include socio-psychological and academic problems as follows:

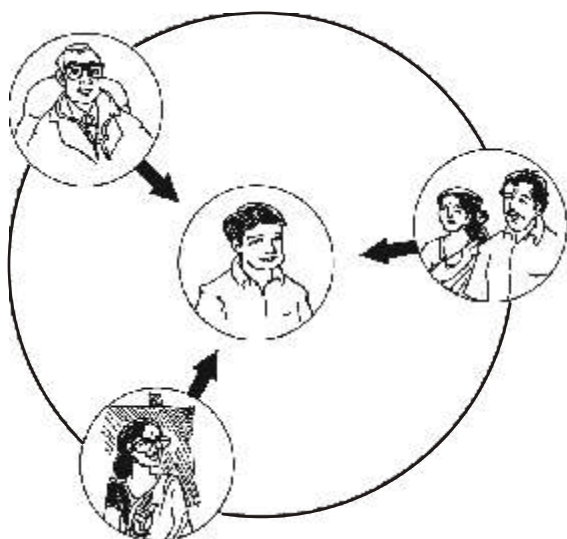
- Social isolation
- Social discrimination
- Decreased self-esteem
- Poor self-image
- Inferiority complex
- Low self-confidence
- Rigid personality
- Anxiety
- Depression
- Learning difficulties

- Body image disorder
- Bulimia
- Anorexia nervosa
- Diffidence in exposing skills or talents
- Introverted personality



Hence the school, the parents and the child must be involved to prevent and control obesity. Certain guidelines could be obtained from professional psychologists to modify behavior, exercise and life style; to develop personality and enhance personal growth including the development of willpower, confidence and a healthy self-image.

A diagram of role distribution in a three way channel to guide a child to prevent obesity.



Points to be remembered by parents and teachers regarding child's play and exercise; dietary habits; reinforcement models; communication approaches are as follows:

- Parents, teachers and children have different ideas about sports and exercise. Children are not aware of physical activity and exercise, but they certainly know how to play.
- Parents and teachers who consider exercise as healthy activity, like to control their wards but children just hate regimented play.
- When playing games is changed into exercise; children often choose computer games and television. So encourage them to play out doors e.g. walking, running, skipping, jumping, hopping, dancing, catching and throwing etc.
- Parents and teachers need to know how to keep their children interested in exercise with out making it seem mandatory.
- Children hate it when someone else decides what they should play. They like to discover for themselves what games interest them. Parents and teachers cannot understand their choices, until they think about their own childhood.
- Most children will eventually find a game they like. More likely, they will have two or three favorite

games. A mix of sports will ensure fitness by exercising all major muscles.

- Parents are more successful as role models than teachers. So parents must practice certain good health habits related to exercise, choose the right kind of food and inculcate good behavior
- Children will naturally take up whatever sports their parents enjoy, but they will continue with that sport only if they do not feel pressurized, Children will also joyfully accompany their parents everywhere- even on long walks and swims.
- Just don't tell your children that this stuff is called exercise.
- Although kids may prefer their parents to stay out of their sports life, there is a definite role for parents.
- Children are poor judges of safety and the best thing parents can do is to ensure a safe playing environment. Safety benefits parents and children alike.
- Parents tend to be relaxed about what their children play once they feel confident about the safety aspect.
- Parents should also look out for injuries. Children have poor reflexes, which make falls more dangerous. Injuries in children may damage growth plates at the bone tips and impair long- term growth.



PREVENTION OF CHILDHOOD OBESITY AND DIABETES

- Children must be provided ample opportunities to participate in physical activities for at least 60 minutes per day.
- Children should not spend more than 2 hours a day watching television or playing computer games.
- Parents and teachers should observe their child's eating pattern as well as behavioral aspects because emotionally disturbed children mostly adopt poor eating habits like over eating, eating only junk foods or out side food or always preferring one variety of food.

Guidelines for parents

Mothers please ... make a note to remember these points!!!!

Model a healthy lifestyle:

Children and teens should participate in at least 60 minutes of moderate physical activity most days of the week, preferably daily. Remember that children imitate adults. Start adding physical activity to your own daily routine and encourage your child to join you. Cultivating good habits like exercising regularly and healthy eating will go a long way in preventing childhood obesity.

Create an Active Environment:

- Assign active chores to every family member such as cleaning the house, hanging out the clothes to dry on the terrace if living in an apartment or washing the car. Rotate the schedule of chores to avoid boredom.
- Enrol your child in a structured activity that he or she enjoys, such as cricket, football, tennis, martial arts, etc.



- Instill an interest in your child to try a new sport by joining a team at school or in the local club.
- Limit the amount of TV watching and when children do watch TV hold a contest to see who can jump or skip the most during a commercial break.
- Take the initiative to go cycling in the park, hiking, swimming during weekends and holidays. Be active with your child.
- It is important for parents with overweight or obese children to remember that they do not emphasize the fact that the activity they involve the child in is solely for weight loss.

Create a Healthy Eating Environment:

- Give the child sufficient time to finish meals – do not hurry the child
- Serve appropriate servings as explained in the food guide pyramid
- Do not force the child beyond her natural inclination to eat
- Avoid showing anger and saying things that will produce feelings of guilt
- Regular timings are best for meals and snacks
- Food should not be used as a reward or punishment



- Remove leftover food within a reasonable time.
- Do not always meet friends over meals or snacks – plan other activities you can do together, such as walks, bowling or a workout.
- Get involved in activities that make you feel good about yourself.
- Train children to read labels of packaged foods and identify those with high fat content.
- Make it a point to pack an attractive lunch for kids, so that they will not look for canteen food.
- Make meal times happy
- Always allow children to go for out door activities
- Take children along with you for buying vegetables, allow them to select the vegetables on their own
- Vegetables such as carrots, beetroot, broccoli, cabbage, tomato etc have got some pigments which are really rich in nutrients and prevent many diseases. So make the dining table attractive by incorporating all these foods
- Limit the frequency of fast-food eating to not more than once per week.

Guidelines for schools

Education curriculum policy

- Include topics on healthy eating and exercise in the syllabus.
- Use school report cards to make parents aware of their children's weight problem.
- Conduct frequent awareness campaigns on healthy eating and physical activity, involving the students through painting competitions, posters, skits, debates etc.

School canteen policy

- Encourage the students to bring healthy foods for the lunch and snack breaks.
- Do not allow unhealthy snacks to be sold in or near the school premises.
- School canteens should have some healthy snacks at lower prices.

Physical activity policy

- Make sure that the allotted time for physical training is utilized by the students and provide space for the same.
- Give the option to children to be part of any organized sports like cricket, football, swimming in the school or in the nearby local club.
- Encourage early morning physical activity in school.
- Organise a health club in school.

Encourage outdoor play rather than videogames or computer games.

Ten Commandments for preventing childhood obesity and diabetes

1. Do regular exercise for at least 30 minutes every day.
2. Avoid high calorie fried snack items and take plenty of fruits instead.
3. When thirsty, avoid intake of aerated bottled drinks and increase water consumption.
4. Play plenty of outdoor games and keep physically active.
5. Reduce TV watching to a minimum.
6. Help your parents in household work like gardening and cleaning.
7. Avoid frequent eatouts at restaurants.
8. Avoid skipping main meals to prevent unnecessary snacking.
9. Maintain regular meal and sleep timings.
10. Parental supervision is needed during most meal times.