



PERIYAR ARTS COLLEGE, CUDDALORE -1
PG & RESEARCH DEPARTMENT OF ZOOLOGY
AFFILIATED TO THIRUVALLUVAR UNIVERSITY

STUDY MATERIAL

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SUBJECT PAPER	Public health and Hygiene (SBS-1)		PAPER CODE BSZO32A
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UNIT -IV	Non – communicable diseases and their preventive measures such as Hypertension, Coronary Heart Diseases, Stroke, Diabetes, Obesity and Mental ill – Health. Alcoholism and drug dependence.
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- * High blood pressure is a common condition in which the long-term force of the blood against artery wall is high enough that it may eventually cause health problems, such as heart disease.

Symptoms

- * Most people with high blood pressure have no signs or symptoms, even if blood pressure readings reach dangerously high levels.
- * A few people with high blood pressure may have headaches, shortness of breath or nosebleeds, but these signs and symptoms are not specific and usually do not occur until high blood pressure has reached a severe or life-threatening stage.

Hypertension stage 1

- * When blood pressure consistently ranges from 130-139 systolic or 80-89 mm Hg diastolic. At this stage of high blood pressure, doctors are likely to prescribe lifestyle changes and may consider adding blood pressure medication based on your risk of atherosclerotic cardiovascular disease, such as heart attack or stroke.

Hypertension stage 2

- * When blood pressure consistently ranges at 140/90 mm Hg or higher. At this stage of high blood pressure, doctors are likely to prescribe a combination of blood pressure medications & lifestyle changes.

Hypertensive crisis

- * This stage of high blood pressure requires medical attention. If your blood pressure readings suddenly exceed 180/120 mm Hg, wait 5 mins and then test your blood pressure again. If your readings are still unusually high, contact your doctor immediately.

Blood pressure is recorded as two numbers.

- * Systolic blood pressure (the first number) - Indicates how much pressure your blood is exerting against your artery walls when the heart beats.

Diastolic blood pressure (the second number) -

Indicates how much pressure your blood is exerting against your artery walls while the heart is resting between beats.

Know the blood pressure (BP) - Measurements fall into 4 general categories:

Systolic is the top number and diastolic is the bottom number of a BP readings

Normal BP - Systolic is less than 120 and diastolic is less than 80.

Elevated BP - Systolic is 120-129 and diastolic is less than 80.

Stage - I Systolic is 130-139 and diastolic is 80-89.

Stage - 2. Systolic is 140 or higher or my diastolic is 90 or higher.

Systolic is higher than 180 and /or diastolic is higher than 120.

Control

Changing your lifestyle can go a long way toward controlling high blood pressure.

- Eating a heart-healthy diet with less salt
- Getting regular physical activity
- Maintaining a healthy weight or losing weight if you are overweight or obese
- Limiting the amount of alcohol you drink.

Coronary heart disease

- * Coronary heart disease (CHD) or coronary artery disease, develops when the coronary arteries become too narrow. The coronary arteries are the blood vessels that supply oxygen and blood to the heart.
- * CHD tends to develop when cholesterol builds up on the artery walls, creating plaques. These plaques cause the arteries to narrow, reducing blood flow to the heart. A clot can sometimes obstruct the blood flow, causing serious health problems.
- * Coronary arteries form the network of blood vessels on the surface of the heart that feed it oxygen. If these arteries narrow, the heart may not receive enough oxygen rich blood, especially during physical activity.
- * CHD develops as a result of injury or damage to the inner layer of a coronary artery. This damage causes fatty deposits of plaque to build up at the injury site.
- * These deposits consists of cholesterol and other waste products from cells. This buildup is called atherosclerosis.
- * If pieces of plaque break off or rupture, platelets will cluster in the area in an attempt to repair the blood vessel. This cluster can block the artery and reduce or block blood flow, which may lead to a heart attack.

Symptoms

- * CHD can lead to angina. This is a type of chest pain linked to heart disease.
Angina may cause the following feelings across the chest:

- squeezing
- pressure
- heaviness
- tightening

- burning
- aching

Diagnosis

- * Electrocardiogram: This records the electrical activity and rhythm of the heart.
- * Echocardiogram: This is an ultrasound scan that monitors the pumping heart. It uses sound waves to provide a video image.
- * Stress test: This may involve the use of a treadmill or medication that stresses the heart in order to test how it functions when a person is active.
- * Coronary catheterization: A specialist will inject dye through a catheter they have threaded through an artery, often in the leg or arm. The dye shows narrow spots or blockages on an x-ray.
- * CT scan: These help the doctor visualize the arteries, detect calcium within fatty deposits, and characterize any heart anomalies.
- * Blood tests: To measure blood cholesterol levels.

factors for stroke are similar to those for CHD, their relative importance differs (6).

2. Transient ischaemic attacks (TIA):

One phenomenon that has received increasing attention is the occurrence of TIA in a fair proportion of cases. These are episodes of focal, reversible, neurological deficit of sudden onset and of less than 24 hours duration. They show a tendency to recurrence. They are due to microemboli, and are a warning sign of stroke.

Host factors:

(i) Age: Stroke can occur at any age. Usually incidence rates rise steeply with age. In developed countries, over 80 per cent of all stroke deaths occur in persons over 65 years. In India, about one-fifth of all strokes occur below the age of 40 (called "strokes in the young"). This is attributed to our "young population", and shorter life expectancy (about 55 years).

(ii) Sex: The incidence rates are higher in males than females at all ages.

(iii) Personal history: The WHO Study (1) showed that nearly three-quarters of all registered stroke patients had associated diseases, mostly in the cardiovascular system or of diabetes. This supports the view that in most cases stroke is merely an incident in the slowly progressive course of a generalised vascular disease (1)

Stroke control programme

The aim of a stroke control programme is to apply at community level effective measures for the prevention of stroke. The first priority goes to control of arterial hypertension which is a major cause of stroke. As transient ischaemic attacks (TIA) may be one of the earliest manifestations of stroke, their early detection and treatment is important for the prevention of stroke (2). Control of diabetes, elimination of smoking, and prevention and management of other risk factors at the population level are new approaches. Treatment for acute stroke is largely the control of complications. Facilities for the long-term follow-up of patients are essential. The education and training of health personnel and of the public form an integral part of the programme. For any such programme, reliable knowledge of the extent of the problem in the community concerned is essential (2).

In summary, control of stroke that was once considered an inevitable accompaniment to aging is now being approached through primary prevention. It has generated the hope that stroke can be tackled by community health action

Diabetes

- * Diabetes is a disease that occurs when your blood glucose, also called blood sugar, is too high. Blood glucose is your main source of energy and comes from the food you eat. Insulin, a hormone made by the pancreas, helps glucose from food get into your cells to be used for energy.
- * Sometimes your body does not make enough or any insulin or does not use insulin well. Glucose then stays in your blood and does not reach your cells.
- * Over time, having too much glucose in your blood can cause health problems. Although diabetes has no cure, you can take steps to manage your diabetes and stay healthy.
- * High blood glucose leads to problems such as
 - heart disease
 - strokes
 - kidney disease
 - eye problems
 - dental disease
 - nerve damage
 - foot problems

Diagnosis

A fasting glucose test is a test of your blood sugar levels taken in the morning before you have eaten. A level of 126 mg/dL or higher may mean that you have diabetes.

An oral glucose tolerance test entails drinking a beverage containing glucose and then having your blood glucose levels checked every 30 to 60 mins for up to 3 hrs. If the glucose level is 200 mg/dL or higher at 2 hrs, then you might have diabetes.

Treatment

Insulin pumps
Islet cell transplant
Tablets and medication (metformin and sulphonylureas)
weight loss surgery
Diet and Exercise

most used

(g) **Psychosocial factors** Psychosocial factors (e.g. emotional disturbances) are deeply involved in the aetiology of obesity. Overeating may be a symptom of depression, anxiety, frustration and loneliness in childhood as it is in adult life. Excessively obese individuals are usually withdrawn, self-conscious, lonely and secret eaters. An insight into the circumstances in which the obesity has developed is essential for planning the most suitable management.

(h) **Familial tendency** Obesity frequently runs in families, but this is not necessarily explained solely by the influence of genes.

(i) **Endocrine factors** These may be involved in occasional cases, e.g. Cushing's syndrome (growth hormone deficiency).

Assessment of obesity

Before we consider assessment of obesity, it will be useful to first look at body composition as under:

- a the active mass (muscle, liver, heart etc.)
- b the fatty mass (fat)
- c the extracellular fluid (blood, lymph, etc.)
- d. the connective tissue (skin, bones, connective tissue)

(Structurally speaking, the state of obesity is characterised by an increase in the fatty mass at the expense of the other parts of the body. The water content of the body is never increased in case of obesity.

Although obesity can easily be identified at first sight, a precise assessment requires measurements and reference standards. The most widely used criteria are:

1) BODY WEIGHT

Body weight, though not an accurate measure of excess fat, is a widely used index. In epidemiological studies it is conventional to accept + 2 SD (standard deviations) from the median weight for height as a cut-off point for obesity.

For adults, some people calculate various other indicators such as (5):

Handy index

① **Body mass index (Quetelet's index)**

$$\frac{\text{Weight (kg)}}{\text{Height}^2 (\text{m})}$$
Actual diet

② **Ponderal index**

$$\frac{\text{Weight (kg)}}{\text{Height (cm)}}$$
BMI > 30 - Male > 28.6 - Female

③ **Broca index**
 = Height (cm) minus 100
 For example, if a person's height is 160 cm, his ideal weight is (160-100) = 60 kg

④ **Lorentz's formula**

$$\text{HI (cm)} - 100 - \frac{\text{HI (cm)} - 150}{2 (\text{women}) \text{ or } 4 (\text{men})}$$
160 - 100 - 20/4

⑤ **Corpulence index**

$$\frac{\text{Actual weight}}{\text{Desirable weight}}$$
170 - 100 - 5 = 6

[This should not exceed 1.2]

The body mass index (BMI) and the Broca index are widely used. A recent FAO/WHO/UNU Report (9) gives the much needed reference tables for body mass index (see table 1) which can be used internationally as reference standards for assessing the prevalence of obesity in a community.

SKINFOLD THICKNESS

A large proportion of total body fat is located just under the skin. Since it is most accessible, the method most used is the

measurement of skinfold thickness. It is a rapid and "non-invasive" method for assessing body fat. Several varieties of callipers (e.g. Harpenden skin callipers) are available for the purpose. The measurement may be taken at all the four sites - mid-triceps, biceps, subscapular and suprailiac regions. The sum of the measurements should be less than 40 mm in boys and 50 mm in girls (10). Unfortunately standards for subcutaneous fat do not exist for comparison. Further, in extreme obesity, measurements may be impossible. The main drawback of skinfold measurements is their poor repeatability.

3. OTHERS

In addition to the above, three well-established and more accurate measurements are used for the estimation of body fat. They are measurement of total body water, of total body potassium and of body density. The techniques involved are relatively complex and cannot be used for routine clinical purposes or for epidemiological studies (6). The introduction of measuring fat cells has opened up a new field in obesity research.

Hazards of obesity

Obesity is a health hazard and a detriment to well-being which is reflected in the increased morbidity and mortality: (a) **INCREASED MORBIDITY**: Obesity is a positive risk factor in the development of hypertension, diabetes, gall bladder disease and coronary heart disease. There are in addition, several associated diseases, which, although not usually fatal, cause a great deal of morbidity in the community, e.g., varicose veins, abdominal hernia, osteoarthritis of the knees, hips and lumbar spine, flat feet and psychological stresses particularly during adolescence. Obese persons are exposed to increased risk from surgery. Obesity may lead to lowered fertility. (b) **INCREASED MORTALITY**: The Framingham Heart Study in United States showed a dramatic increase in sudden death among men more than 20 per cent overweight as compared with those with normal weight. The increased mortality is brought about mainly by the increased incidence of hypertension and coronary heart disease. There is also an excess number of deaths from renal diseases. Obesity lowers life expectancy. More information is needed about the relationship between different degrees of obesity and morbidity and mortality.

Prevention and control

Prevention should begin in early childhood. Obesity is harder to treat in adults than it is in children. The control of obesity centres round weight reduction. This can be achieved by dietary changes, increased physical activity and a combination of both. (a) **Dietary changes**: The following dietary principles apply both to prevention and treatment: the proportion of energy-dense foods such as simple carbohydrates and fats should be reduced; the fibre content in the diet should be increased through the consumption of common un-refined foods; adequate levels of essential nutrients in the low energy diets (most conventional diets for weight reduction are based on 1000 kcal daily model for an adult) should be ensured, and reducing diets should be as close as possible to existing nutritional patterns (3). The most basic consideration is that the food energy intake should not be greater than what is necessary for energy expenditure. It requires modification of the patient's behaviour and strong motivation to lose weight and maintain ideal weight. Unfortunately, most attempts to reduce weight in obese persons by dietary advice remain unsuccessful (b) **Increased physical activity**: This is an important part of reducing programme. Regular physical exercise is the key to an increased energy expenditure. (c) **Others**: Appetite suppressing drugs have been tried in the control of obesity. They are generally inadequate to produce massive weight loss in severely obese patients. Surgical treatment (e.g., gastric bypass, gastroplasty, jaw-wiring to eliminate the eating of solid food) have all been tried with limited success (11). In short, one should not expect quick or even tangible results in all cases from obesity prevention programmes. Health education has an important role to play in teaching the people how to reduce overweight and prevent obesity. A

Alcoholism and Drug dependence

Signs of alcohol or other drug dependence.

- * Some signs that you may have an alcohol or other drug problem are:
 - changed eating or sleeping habits
 - Caring less about your appearance
 - spending more time with people who drink or use drugs to excess
 - missing appointments, classes or work commitments
 - losing interest in activities that you used to love
 - getting in trouble in school, at work or with the law
 - getting into more arguments with family and friends
 - friends or family asking you if you have a substance abuse problem
 - relying on drugs or alcohol to have fun or relax
 - having blackouts
 - drinking or using drugs when you are alone
 - keeping secrets from friends or family
 - finding you need more and more of the substance to get the same feeling.

- * Often it is family and friends who first recognise that a person they care about has an alcohol or drug problem. They may have noticed them acting differently - being withdrawn, always tired, increasingly hostile or easily upset. They may ask the person straight out if they have a problem.

- * If that happens to you, you might feel threatened or criticised. Try to remember that they are trying to look out for your wellbeing. A positive first step would be to listen, reflect, and be honest with yourself about what they had to say.

Recognising an alcohol and drug problem

- * There is no particular type of person who becomes dependent on alcohol or other drugs. It can happen to anyone.

* What starts as occasional use of a drug or one prescription of pain-relieving medication, for example, can get out of control as time passes - especially in times of pain or stress. You may find you need bigger doses to get the same feeling or to lessen the pain. Eventually, you may depend on the drug to feel good or to get through your day.

* Other signs that you are becoming dependent on alcohol or other drugs include:

- having intense urges for the substance - this could be once a day or several times a day
- needing more of a substance to get the same effect
- fixating about making sure you have a constant supply of the substance
- spending money on the substance, even when you cannot afford it
- cutting back on social or other activities
- not meeting your work, family or study responsibilities
- lying to people about your alcohol or drug use when they ask
- doing things that are illegal so you can get the substance, such as stealing
- taking risks such as driving when you are under the influence of substance
- trying but failing to stop using the substance
- experiencing withdrawal symptoms when you try to stop taking the substance.

Reducing or stopping use of alcohol or other drugs

* Cutting down on alcohol or other drugs is hard to do because repeated alcohol or drug use makes the body more dependent and changes the brain.

* Brain scans of people who are dependent on alcohol or other drugs often show changes in the areas of the brain that help you learn and remember and make decisions.

* The best thing you can do is to talk to someone you trust you do not have to deal with this challenge alone.