BHARATHIDASAN UNIVERSITY

Tiruchirappall-620O24

Tamil Nadu-India

Programme: MPED , physical education

course title : TEST, MESUREMENT AND EVALUATION IN PHYSICAL EDUCATION

course code : 21MPE11

UNIT – IV ANTHROPOMETRIC MEASUREMENT,PHYSIOLOGICAL PSYCHOLOGICAL PARAMETERS ASSESSMENTS

DR A.MAHABOOBJAN

PROFESSOR

DEPT OF PHYSICAL EDUCATION & YOGA

P.PREMNATH

GUEST LECTURER

DEPT OF PHYSICAL EDUCATION &YOGA

ANTROPOMETRIC MEASUREMENTS

- Height, standing
- Height, sitting
- Weight
- Waist circumference
- Waist-to-hip ratio
- Waist-to-height ratio
- Body mass index, or BMI (weight in kilograms divided by square of height in meters)
- Grip strength
- Skinfold body fat measurement

Landmark and measurement of various body segment

- SAK Landmarks ISAK uses anatomical landmarks to ensure precision and repeatability. These include : Acromion: Bony prominence at the top of the shoulder. Radiale: Lateral aspect of the elbow, near the humerus head . Mid-stylion: Wrist landmark, at the midpoint of the styloid processes .

Trochanterion: Uppermost part of the femur at the hipibiale: Proximal part of the tibia (shinbone).Medial and Lateral Epicondyle: Projections on the femur, at the knee joint . Iliac Crest: Top of the pelvis bone. Suprapatella: Top of the kneecap . Malleolus (Medial/Lateral): Ankle bony prominences . Cervicale: 7th cervical vertebra at the back of the neck. Subscapulare: Point below the scapula (shoulder blade).Xiphoid Process: Lower end of the sternum (chest bone)

PHYSIOLOGICAL TESTING

- Cardiovascular Tests

VO2 Max Testing : Measures maximal oxygen uptake during exercise; a key indicator of cardiovascular fitness

Heart Rate Variability (HRV): Evaluates the variation in time between heartbeats to assess stress and recovery .

Stress Tests: Monitors heart performance under controlled physical exertion.

Respiratory Tests

Spirometry: Measures lung function, including the volume and speed of air inhaled and exhaled

- . Respiratory Tests
  Spirometry: Measures lung function, including the volume and speed of air inhaled and exhaled.
  Lactate Threshold Testing: Determines the exercise intensity at which lactate begins to accumulate in the blood.
  Muscular and Strength Tests1-Rep Max (1RM): Assesses the maximum weight a muscle group can lift in a single repetition
  Isokinetic Testing: Measures muscle strength and endurance using specialized equipment.
  Metabolic Testing Basal Metabolic Rate (BMR): Calculates the number of calories burned at rest . RMR (Resting Metabolic Rate): Determines daily caloric needs for basic functions.5. Body Composition Analysis Bioelectrical Impedance Analysis (BIA): Measures body fat percentage, lean mass, and hydration levels . DEXA Scans

Margaria – kalamen test , wintage aerobic test

- The Margaria- Kalamen test is a physiological assessment used to measure power output of the lower body, particularly the explosive power in the legs. It is commonly used in sports performance evaluations.
- Procedure
- 1. Equipment Needed : A staircase with at least 9 steps, each approximately 17.5 cm (7 inches) high .
- A stopwatch.
- A tape measure to measure the height of the steps .
- A weighing scale to determine body weight .

Markers or cones for start/finish lines.

- . Set- Up:
- Place markers on the 3rd and 9th steps of the staircase . Measure the vertical height between these steps.
- Execution :
- The athlete starts 6 meters away from the stairs and runs at maximum speed toward them
- . They ascend the stairs, stepping on the 3rd, 6th, and 9th steps as quickly as possible .
- The stopwatch starts as the athlete hits the 3rd step and stops when they hit the 9th step.

- . Calculations: The formula to calculate power is:P = \frac{{(Weight \times 9.81) \times Vertical Height}}{{Time}}
- P = Power output (in watts).
- Weight = Athlete's weight (in kilograms).
- Vertical Height = Height between the 3rd and 9th steps (in meters).
- Time = Time taken to ascend from the 3rd to the 9th step (in seconds).

- Wingate Test
- The Wingate Anaerobic Test (WAnT) is used to measure anaerobic power and capacity. It involves a short-duration, high-intensity cycling effort.
- Procedure
- 1. Equipment Needed:
- A stationary cycle ergometer with adjustable resistance.
- A stopwatch or computerized timing system.
- 2. Set-Up:The athlete warms up for 5-10 minutes at a moderate pace.
- The resistance is set based on the athlete's body weight (commonly 0.075 kg per kilogram of body weight).

- Execution:
- The athlete pedals as fast as possible for 30 seconds while the resistance is applied.
- The test administrator records the athlete's peak power, average power, and the rate of fatigue during the effort.
- Key Metrics:
- Peak Power (PP): The highest power output during the test.
- Mean Power (MP): The average power output over 30 seconds .
- Fatigue Index (FI): The rate at which power declines during the test.