Protocol for Physical Measures as part of The CSPPA Study (2009)

2. Physical Measurements

A. Height Protocol

Equipment:

1. Standard collapsible portable stadiometer
2. Data collection sheets

Set-up:

1. Construct stadiometer following instructions.
2. Place it on a level, flat, hard surface with the stabilizing bar against a vertical surface such as a wall or door.

Instructions to participant:

1. Remove shoes
2. If the hairstyle affects their height, ask them to adjust it for the test
3. Stand with heels and toes together on the base plate
4. Arms loosely by their side
5. Back straight against the vertical measuring rods
6. Look straight ahead
7. Take a deep breath and stand as straight as possible without their heels lifting off the ground.

Note: These can be difficult instruction for children/youth to follow – make sure the head is not tilted or the shoulders raised, breath normally. Check posture before measuring.

Record in metres to nearest 1/10th of a centimetre
B. Weight Protocol

Equipment:

1. Standard portable calibrated scales
2. Data collection sheets

Set-up:

1. Ensure scales are pre-calibrated with a known weight
2. Place scales on a hard, level surface

Instructions to participant:

1. Wear only light garments
2. Remove items such as keys and money from pockets
3. Remove shoes.
4. Stand on the scales, with both feet fully on the weighing platform, heels towards the back edge, and their arms loosely by their side.
5. Remain as still as possible with their head facing forward.
6. Step down from the scale.

Record in kilograms to nearest ½ gram

Height and weight will be used to calculate Body Mass Index (BMI)

\[
BMI = \frac{\text{Weight (kg)}}{\text{Height (m}^2)}
\]

BMI measurements help classify the weight of an individual as underweight, normal, overweight or obese. Formulas used are age and gender specific.

References


C. Waist/hip ratio

Equipment:
1. Standard anatomical measuring tape
2. Data collection sheets

Set-up:
1. The measurements will be taken in an enclosed place so the participant feels comfortable.
2. A teacher should be present.
3. Same-gender tester will take measurements.

(i) Waist girth

Instructions to participant:
1. Stand comfortably up straight facing tester.
2. Pull up and tuck their jumpers or t-shirts so that you can see the naval/belly button.
3. Hands by side.
4. Breathe normally.
5. They should not contract abdominal muscles.

Procedure:
1. Pull a length of the measuring tape, holding both ends in left hand, and bring it around the participant.
2. Stretch tape out. Unite both ends at the front by inserting catch. Take slack out of tape by pressing button. (Skin should not be compressed, and there should not be space between skin and tape).
3. Measure the narrowest point of the abdomen, ensuring the tape is level.
4. If no one point is evident, measure half way between the lowest rib and the iliac crest landmark or an inch above the belly button.

Record in centimetres to the nearest 0.1cm

(ii) Hip girth

Instructions to participant:
1. Stand side on to tester.
2. Remove any bulk from pockets.
3. Feet together
4. They should not contract gluteal muscles.

Procedure:
1. Pull a length of the measuring tape, holding both ends in one hand, and bring it around the participant.
2. Stretch tape out. Unite both ends at the side by inserting catch. Take slack out of tape by pressing button.
3. Clothing should be compressed but not underlying tissue.
4. Measure the widest point around the gluteals ensuring the tape is level.

Record in centimetres to the nearest 0.1cm

(iii) Calculate Waist to Hip Ratio (WHR):

The circumference of the waist divided by the circumference of the hips.

Waist/hip ratio will be used to measure body fat distribution, which is an important predictor of the health risks associated with obesity, particularly abdominal fat. Health risk increases with WHR, and standards for risk vary with age and gender. For example health risk is very high for young men when WHR is more than 0.94 and for young women when WHR is more than 0.82. The pattern of body fat distribution is recognised as an important predictor of the health risks of obesity.

Reference:
ACSM Guidelines for Exercise Testing and Prescription, 2000

D. Blood pressure

Equipment:
1. Conventional mercury sphygmomanometer (use appropriate cuff size)
2. Data collection sheets

Set-up:
1. Quiet room
2. Chair
3. Table facing chair

Instructions to participant:
1. Sit down with back against chair and with feet flat on the floor
2. Relax and breathe normally
3. Expose your upper left arm
4. I will place the cuff on your arm and inflate it, so you will feel it getting tighter
5. Then using a stethoscope and gradually deflating the pressure from the cuff I will read you blood pressure

Procedure:
1. Place the cuff on the upper arm
2. Locate the pulsation of the brachial artery at the inner side of the upper arm, approximately 1 inch above the bend in the elbow
3. Place stethoscope bell below the antecubital space over the brachial artery.
4. Support the participants arm at the elbow with the arm in a horizontal position at heart level.
5. Before inflating the cuff, make sure the air-release switch remains closed (turn the knob clockwise)
6. Inflate the cuff quickly up to 180 mm Hg
7. Gradually release cuff pressure by slowly opening the air-release knob, noting the pressure at the 1st sound (Systolic blood pressure - this comes from the turbulence from the rush of blood as the formerly closed artery briefly opens during the highest pressure in cardiac cycle)
8. Continue to reduce pressure, noting when the sound becomes muffled (4th phase diastolic pressure)

Record in mmHg

- Blood pressure reflects the force (pressure) exerted by blood against the arterial walls during a cardiac cycle. Systolic blood pressure is higher of the two pressure measurements.
- Normal systolic blood pressure in teenagers (15-17) varies between 90 and 115 mmHg and diastolic pressure ranges from 60 and 80 mmHg.

E. Physical Fitness

Description
The 20-meter Shuttle Run ((Ramsbottom et al., 1988) is a progressive running test that gives an estimate of maximum oxygen carrying capacity (VO$_2$ max). It is a validated field measure of aerobic fitness with a correlation of 0.92 between lab measured VO$_2$ max and shuttle level achieved (Ramsbottom et al., 1988). Low levels of cardio respiratory fitness can result in premature death from cardiovascular diseases.

The ‘shuttle’ runs are done in time to pre-recorded ‘bleep’ sounds on an audio cassette. The test usually consists of 23 levels. A level is a series of 20 metre ‘shuttle runs’. Each level lasts 60 seconds and the time between the recorded ‘bleeps’ decreases for each new level. The starting speed is normally 8.5 km/hr and then increases by 0.5km/hr with each new level.

**Equipment**

- Tape measure
- Flat, non-slippery surface of at least 20 meters in length
- Markers or cones or lines
- Recorded ‘bleep’ audio cassette and a tape player. Have a spare tape!
- Extension lead for cassette player if indoor? Spare batteries if taken outdoor
- Recording sheets
- Bibs (Coloured & numbered)

**Procedure**

1. Measure 20m area and mark out with cones at each end.

![Image of 20m area marked out with cones]

2. Measure width of hall and determine number of participants (Guide: 1 student per metre with adequate clearance of obstacles at each side)

3. Rewind cassette and place in tape recorder ready to start. If consecutive tests are to be run, there should be 2+ cassettes.

4. Calibrate. At the start of the tape there is a calibration section, which consists of two, beeps 60 seconds apart, this is to ensure that the tape has not been stretched and the speed of the tape player is accurate. Accuracy is sufficient within 0.5 seconds either way.

5. Hand out bibs and note bib number and colour on relevant sheet.

6. Warm-up: consist of 5-10 minutes of moderate intensity aerobic activity (light jogging) followed by activity specific stretches for neck, shoulders, hamstrings, quadriceps, groin, calf and ankles.

7. Cool-down will consist of 5 minutes of moderate intensity aerobic activity (light jogging) followed by activity specific stretches as described above.

Instructions to participant:

1. Before switching on the tape, explain the test to the participants
2. Tell them:
a. The test commences with a 5 second countdown to the start.
b. Following this and for the duration of the test, single bleeps are released at regular intervals.
c. Try to reach the opposite end to the start before the next bleep is heard.
d. If you get there before the bleep is emitted, wait there until the bleep is heard before running back to the opposite end. This is important in the first level, as the speed is very slow.
e. After each level, the time between bleeps will decrease so you need to run faster.
f. Each level lasts one minute; changing levels is marked by a triple bleep and from instruction on the tape.
g. Place one foot on or before the line at the end of each shuttle run.
h. Give your maximum effort at the end of the test and to attempt to reach the highest level possible level that you can.
i. You can drop out from the test at any stage but you should try to keep going as long as possible

Procedure for withdrawing students:

1. If participants are not complying with the instructions, they should be given two warnings before being withdrawn from the test.
2. Examples of this would be participants not touching the line at the end of each shuttle, or starting each shuttle before the bleeps are emitted.
3. N.B. Protocol: Two people will be watching the lines and motivating students. If you see that someone has missed the line, call out his or her number (e.g. “yellow number 1, make the next line”) loud enough so the other tester can hear. The second tester watches the second line. If the student misses the second line, the second tester must pull them out (e.g. “yellow number 1, stop running”). Follow through with this; if they continue to run stop them.

Precautions:

- In order for the test results to be accurate and reproducible, as well as comparable with scores obtained elsewhere, it is essential that the test procedure be carried out properly. This includes exact measurements of the 20-meter distance, as well as standardisation of the running surface, pre test preparations and environmental conditions.
- The Multistage Fitness Test requires maximal effort if the test result is to be valid. Anyone with any doubts over his or her ability to take part in the test should seek medical advice beforehand. Individuals with any injury or illness are advised not to take the test.
- Since the test starts very slowly, there is a gentle warm-up as the test progresses. However, it is advisable to have some very light jogging and gentle stretching before starting
- The width of the indoor/outdoor facility will determine how many students can participate in the test at one time.
- There should be at least three individuals looking after the 20 MST at any given time.
Evidence for use of 20 MST among adolescents:

The testing protocol of the 20MST has been widely used internationally. Though initially designed for adults, it is a common choice of aerobic capacity assessment among children and adolescents. A Meta analysis by Tomkinson et al (2003) examined the scores of children and adolescents aged 6-19 between 1981 & 2000 in 11 different countries. They noted a rapid secular decline in the performance in 20 MST and most noticeably in older adolescents. The rate of decline was similar for both genders. Another study by Leder et al (1984) looked at the norms for the 20 MST among a large sample of school boys and girls aged 6-17 in the region of Quebec. They validated the use of the 20 MST based on test results. Additionally they concluded that the school setting has various advantages in terms of group testing, progressive protocol and test validity.

References

- Leger, L. and Gadoury, C, 1989 'Validity of the 20m shuttle run test with 1 minute stages to predict VO2max in adults. Canadian Journal of Sport Science, 14:1 21-26
Appendix 4: Draft Focus Group Scripts

Sample Focus Group Interview Scripts

Primary Interview Questions

1. How do your parents encourage you to participate in physical activity and sport?
2. Do your friends encourage you to participate in physical activity? How do they do this?
3. What kinds of activities do you play in physical education that are fun and make you want to participate?
4. What do you like or dislike about physical education that determines if you will participate?
5. Where do you go to take part in physical activity outside of school?
6. What prevents you from participating in physical activity in or out of school?
7. What could teachers or other do to help you enjoy physical activity more?
8. Do you participate in sport to win or to be with your friends?
9. Is too much of a focus on winning hard for you? Do coaches, parents and teachers think winning is more important than you do?
10. How does the weather or time of year effect your willingness to participate in outdoor activities?

Secondary Interview Questions

1. What kinds of things do your parents do or say to encourage your participation in physical activity and sport?
2. Talk about how your peers support or discourage your involvement in physical activity?
3. What kinds of activities are offered in physical education that encourage you to want to participate?
4. What do you like or dislike about physical education that impacts your choice of participating?
5. Where do you access physical activity outside of school?
6. What are the issues or problems that prevent you from participating in physical activity in or out of school?
7. What could teachers or sport providers do to make participating in physical activity more inviting for you?
8. Do you participate in sport to win or to be with your friends?
9. Does too much emphasis on winning detract from your interest in participating? Do you feel that coaches, parents and teachers put more emphasis on winning than you do?
10. How does weather or time of year impact your willingness to participate in outdoor activities?
**Sport Providers Questions**

- What is the name of your organization?
- How long has the company/organization been in existence?
- Are you aligned with one of the sports governing bodies are you licensed/accredited with another organization or do you work independently?
- How long have you been working with schools?
- How do you make contact with schools?

- What product/service are you providing?
- Do schools/pupils pay for the programme?
- What advantage do you offer schools?
- How have you developed and packaged your programme/s for schools?
  - Probe – growth and maturation patterns, pedagogical frameworks, motivation, perceived-competence, life-long learning, school curriculum requirements, and school educational philosophy, skill framework development.
- How do you measure whether or not the pupils have learnt skills and behaviours?
- What strategies are used to reinforce encourage learning?
- How do you adapt programmes to ensure all pupils are given an opportunity to participate?
- Do you provide professional development for schoolteachers so that they can contribute to the programme and student learning?
- What professional development does your staff engage in to help them deliver the programme?
- What is the biggest challenge in delivering your programme/s in schools?
- Do you work independently in schools or do you work with physical education staff?
- How do you ensure quality assurance in your programmes?
### Physical Activity Readiness Questionnaire (PAR-Q)

**Please Answer Yes or No**

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<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?</td>
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<td>2. Do you feel pain in your chest when you do physical activity?</td>
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<td>3. In the past month, have you had chest pain when you were not doing physical activity?</td>
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<td>4. Do you lose your balance because of dizziness or do you ever lose consciousness?</td>
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<td>5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?</td>
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<td>6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?</td>
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<td>7. Do you know of any other reason why you should not do physical activity?</td>
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