



Loughborough
University

Monitoring and Evaluation: Physical Activity

Dr Lorraine Cale

Presentation Aims

- To outline the reasons for monitoring/evaluating physical activity
- To consider physical activity versus physical fitness monitoring
- To explore some of the main methods, considerations and make recommendations for monitoring/evaluating physical activity

Why Monitor Physical Activity?

- Growing concerns over the lifestyles and physical activity levels of many young people and the links between physical activity and health
- Increased physical activity is a desired outcome of many programmes/interventions
- To establish the extent to which physical activity guidelines are being met
- Can provide a good deal of information to inform future programmes/interventions and practice
- A positive health behaviour which is achievable by all young people
- Is practical/manageable
- For pedagogical reasons

Physical Activity Versus Physical Fitness

- Physical activity = a behaviour (process); fitness = a parameter (product)
- Physical fitness = a set of attributes that a person has or achieves that relate to the ability to perform physical activity
- Fitness testing is common place in schools
- Attractive to many as an objective, well established and convenient measure
- Advocates claim fitness testing promotes active lifestyles, positive attitudes, knowledge and understanding, motivates children etc

But...

- Controversy surrounds fitness testing in children
- Numerous limitations with and assumptions concerning fitness testing
- Little evidence that fitness testing promotes/leads to positive outcomes
- Questions have been raised as to whether fitness tests are useful and serve their intended purposes

Some Limitations with Fitness Testing

- Issues relating to the appropriateness, validity, reliability of fitness tests with children
- A child's activity level cannot be judged from his/her fitness level
- The relationship between children's physical fitness and physical activity is low
- Results may be misleading
 - Consider an active child who scores poorly on a test versus an inactive child who scores well (Corbin, 2002)
- Some fitness tests do not reflect child friendly/ appropriate practice

Factors Influencing Fitness Test Scores

Hereditiy or genetic potential	Growth, maturation & development	Anatomical & physiological characteristics; response to training
Routine activity, exercise	Dietary habits, nutrition	Motivation
Skill level	Environment/ test conditions	Test protocol/ practice

Limitations with Fitness Testing Cont...

- Simply determine the obvious:
 - distinguish the mature and motivated from the immature and de-motivated (Armstrong and colleagues)
- Possible negative outcomes/experiences:
 - repetitive and boring?
 - de-motivating and counterproductive?
 - uncomfortable, demeaning and embarrassing?
 - off putting for those children most at risk?

Does Fitness Testing have a Role?

- **YES** - but only if it is positive, personal and integrated within an educational programme which includes physical activity monitoring and a lifestyle orientation
- **NO** - if it is negative, dominates, makes unfair/unnecessary comparisons, lacks context and learning, puts children off physical activity
- **Note** - practitioners may need guidance and training in order to achieve affective, behavioural and cognitive objectives through fitness testing

Monitoring Physical Activity

Physical activity has multiple dimensions and domains

Dimensions = volume (how much), duration (how long), frequency (how often), intensity (how hard) and mode (what type)

Domains = transport to school, physical activity at school/out of school inc. PE, sport, active play, routine activities

Main Methods Include:

- Self-report - surveys/questionnaires; diaries; proxy reports
- Observation
- Motion sensors - pedometers; accelerometers
- Physiological - heart rate; energy expenditure; doubly labelled water
- All have strengths and limitations

- Recommended field measures include:
 - self-and/or proxy report
 - heart rate monitoring
 - pedometers and accelerometers
 - observation

Self-report

- **Strengths**
 - Convenient and easy to administer
 - Time and cost efficient
 - Measure a variety of variables and provide detailed information
 - Low burden, unobtrusive and non reactive
- **Limitations**
 - Accuracy, validity and reliability
 - Problems with recall, interpretation, misrepresentations, social desirability
 - Not as appropriate for all activity types (e.g., unstructured play)
- **Examples**
 - Previous Day Physical Activity Recall (PDPAR); Three-Day Physical Activity Recall (3DPAR); Physical Activity Questionnaire for Children/Adolescents (PAQ-C/PAQ-A); Youth Risk Behaviour Surveillance Survey (YRBS); Teen Health Survey (see Trost 2007; Biddle et al., 2011)



Pedometers/Accelerometers

Strengths

- Small, easy to use, unobtrusive, socially acceptable
- Permit freedom of movement
- Do not influence 'normal' activity patterns
- Recent advances have led to increased reliability and validity

Limitations

- Provide relatively limited activity information
- Not suitable for all types of activity
- Pedometers do not measure activity intensity

Choosing a Monitoring Method - Considerations

- Measures' strengths and limitations
- Purpose of the assessment
- Scale/size of the intervention/project
- Age of children/participants
- Time
- Finance
- Accuracy-practicality 'trade-off'
- Combination of methods

Recommendations

- Given the limitations of monitoring physical fitness as a model of physical activity promotion, place the emphasis on physical activity
- Promote, facilitate and monitor the process of being physically active and the product (of improved fitness and health) should take care of itself

For Further Information See:

- Association for Physical Education (October, 2015) Health Position paper. <http://www.afpe.org.uk/news-a-events/1035-afpe-health-position-paper>
- Biddle, S.J.H., Gorely, T., Pearson, N. & Bull, F.C. (2011) An assessment of self-reported physical activity instruments in young people for population surveillance: project ALPHA, International Journal of Behavioral Nutrition and Physical Activity, 8(1), 1-9.
- Cale, L. & Harris, J. (2009) Getting the Buggers Fit. (2nd Ed). Continuum. Ch 6.
- Cale, L. & Harris, J. (2009) Fitness testing in physical education – a misdirected effort in promoting healthy lifestyles and physical activity, Physical Education and Sport Pedagogy, 14(1), 89-108.
- Cale, L., Harris, J. & Chen, M.H. (2014) Monitoring health, activity and fitness in physical education: its current and future state of health, Sport Education and Society, 19(4), 376-397.
- Harris, J. & Cale, L. (2015). Association for Physical Education response to Generation Inactive. Physical Education Matters, Autumn, 10 (3), 11.

- Kohl, H.W., Fulton, J.E. & Caspersen, C.J (2000) Assessment of physical activity among children and adolescents: a review and synthesis, *Preventive Medicine*, 31, S54-76.
- Loprinzi, P.D. & Cardinal, B.J. (2011) Measuring children's physical activity and sedentary behaviour, *Journal of Exercise Science and Fitness*, 9(1), 15-25.
- Sanders, J.P. et al., (2016) Devices for self-monitoring sedentary time or physical activity: a scoping review, *Journal of Medical Internet Research*, 18(5), e90. DOI: 10.2196/jmir.5373.
- Trost, S.G. (2007) Measurement of physical activity in children and adolescents, *American Journal of Lifestyle Medicine*, 1(4), 299-314.