
Outcomes


PLAN
DO
CHECK
ACT

OUTCOME MEASUREMENT IN PAEDIATRIC PHYSIOTHERAPY

PURPOSE

- Predict future status
- Discriminate from norm
- Evaluate change over time
- Describe the status of subject

Table 3.1 International Classification of Functioning, Disability and Health (ICIDH-2) definitions of the dimensions and related outcome measurement tools

Dimension	Definition	Example of typical outcome measures
Body function and structure	Body functions are physiological functions of the body systems Body structures are the anatomical parts of the body, such as organs, limbs and their components	Balance scales Range of movement Muscle strength Motor tasks Movement and force analysis of gait Sensory awareness, e.g. functional reach test, goniometery
Activity	The performance of a task or action by an individual	Motor development tests Walking tests Self-care evaluations Play skills, e.g. 6-minute walking test, Gross Motor Function Measure (GMFM), Alberta Infant Motor Scales (AIMS)
Participation	An individual's involvement in life situations in relation to health conditions, body functions and structures, activities and contextual factors	Integration into school Fulfilment of roles and perceived needs Parental care indices Attitudinal scales of ability and disability, e.g. School Functional Assessment, Canadian Occupational Performance Measure (COPM), Juvenile Arthritis Self-Report Index (JASI)

Selection

Reliability

- Reliability is the test of a measure's repeatability and accuracy.
- A reliable measure gives results that are reproducible and consistent.
- Reliability is often tested by repeating the measure on a stable population over a period of time

- ***Reproducibility***
- A measure needs to be reliable in reproducing the same results on several occasions when no change could have occurred.
- This is often assessed by repeating the measure on several occasions over a short period (test – retest reliability)

Validity

- This is the extent to which a measure records **what it intends to record** or ‘the degree of correspondence between the concept being measured and the variable used to represent the concept’

Sensitivity

- **Sensitivity** (also called the **true positive rate**) measures the proportion of actual positives which are correctly identified as such (e.g., the percentage of sick people who are correctly identified as having the condition), and is complementary to the false negative rate.
- **Specificity** (sometimes called the **true negative rate**) measures the proportion of negatives which are correctly identified as such (e.g., the percentage of healthy people who are correctly identified as not having the condition), and is complementary to the false positive rate.

Most frequently used, good-quality outcome measurement tools in pediatric practice

- **1. Canadian Occupational Performance Measure**

(COPM)

- **2. School Function Assessment**
- **3. Functional Independence Measure for Children**

(WeeFIM)

- **4. Child Health Questionnaire**
- **5. Cystic Fibrosis Questionnaire**
- **6. Pediatric Evaluation of Disability Inventory (PEDI)**

7. Gross Motor Function Measure (GMFM)

- **8. Peabody Developmental Motor Scales (PDMS-2)**
- **9. Functional Reach**
- **10. Walk test (6-minute) (6MWT)**
- **11. Alberta Infant Motor Scale (AIMS)**
- **12. Chailey Levels of Ability**
- **13. Movement Assessment Battery for Children Scale**
- (M-ABC test)
- **14. Paediatric Pain Profile (PPP)**

CANADIAN OCCUPATIONAL PERFORMANCE MEASURE (COPM)

Source: Law M, Baptiste S, Carswell A et al 1998 *The Canadian Occupational Performance Measure*, 3rd edn. Toronto: CAOT. Available online at: www.caot.ca/copm/.

Purpose: To detect change in self-perceived performance and satisfaction in self-care, productivity and leisure occupations.

Groups tested: Children with disabilities: the parents completed the COPM.

Description: Semistructured interview that takes 30 minutes to administer. Tasks are rated in terms of importance 1–10 (not important – extremely important). The five highest-ranking tasks are then rated on perception of performance (not able to do it – able to do it extremely well) and satisfaction with performance (not satisfied – extremely satisfied). Can be used to determine performance goals based on the client's perceptions of self-care, productivity and leisure.

Standardization: Standardized by specific administration method and scoring; instruction manual available. No normative data are available.

Reliability: Test – retest good = 0.7–0.9.

Validity: Good.

Strengths: A useful measure of interactions between the child and environment, measuring real and meaningful experiences for the child/parent. Fosters a client-centred approach to measurement and management.

Weaknesses: Cannot help to determine the underlying problem within the perceived problem areas defined by the child/parent. Parent-reported difficulties may not truly reflect the opinions of the child.

Clinical utility: Most therapists found it easy to administer and score, helpful in defining clinical goals, but somewhat dependent upon the ability of the child/parent and the interviewer to elicit reasoned answers.

SCHOOL FUNCTION ASSESSMENT

Source: Harcourt Assessment, Halley Court, Jordan Hill, Oxford, OX2 8EJ. www.harcourt-uk.com.

Purpose: To measure a student's performance of functional tasks that support the student's participation in school. Includes both study and social tasks within an elementary school setting.

Description: Ordinal measure of 317 items. Scaled either 1–4 or 1–6, dependent on the item. Can be used in sections or as a whole:

- Equipment, technology, appliances, tools
- Educational services
- Personal care
- Social relations
- School
- Play
- Transportation.

Rating scale completed by respondents who are familiar with the student's typical performance, e.g. teachers, physiotherapist, occupational therapist, non-teaching support staff.

Standardization: Based on items required for successful school performance; manual is clear and easy to read.

Reliability: High = >0.9.

Validity: High.

Strengths: Robust and easily administered scale corresponds to current exclusivity policies.

Weaknesses: Perceptions may need to be gathered from a number of individuals to complete the whole assessment. Individual opinions may differ.

Clinical utility: A very useful tool in establishing areas of strength and of concern in school integration.

FUNCTIONAL INDEPENDENCE MEASURE FOR CHILDREN (WEEFIM)

Source: Centre for Functional Assessment Research and Uniform Data Systems. www.udsmr.org.

Purpose: To measure the severity of disability and changes in functional ability of children. To 'weigh the burden of care', i.e. physical, technological and financial resources.

Groups tested: Children between 6 months and 8 years with neurodevelopmental disabilities.

Description: An 18-item observational measure. Items are gathered into six domains and in two scales: the cognitive and the motor scale. Items are scored from 1 to 7 on the amount of assistance required to complete the item task. Completed by direct observation or by interview of primary care-giver. Takes approximately 20 minutes to complete.

Standardization: Validated on typically developing children.

Reliability: High = >0.9.

Validity: Good = 0.7–0.9.

Strengths

- Suitable for various disciplines
- Clear instructions
- Easily administered interview format to seek carers' and/or professionals' perspective
- Can be administered at home, school or in the community setting
- Requires no special equipment.

Weaknesses

- Complex scoring and interpretation
- Reported attributes are at risk of subjective bias.

CHILD HEALTH QUESTIONNAIRE

Source: Landgraf JM 1996 *The Child Health Questionnaire (CHQ) Users' Manual*. Boston, MA: The Health Institute. New England Medical Centre, 750 Washington St, Boston MA 02111, USA.

Purpose: To measure the physical and psychosocial well-being of children over the age of 5.

Groups tested: Parents of children with asthma, attention-deficit hyperactivity disorder, epilepsy, psychiatric diagnoses and juvenile rheumatoid arthritis.

Description: A questionnaire format administered to children as a self-report or to their parents as the parental report. Can be self-administered or used in an interview format. Questions are answered on a 4-week recall basis and answered on a four-point ordinal scale. There are multiple forms of the parent report questionnaire and it can take between 15 and 45 minutes to complete depending on the form used.

Standardization: The scale is norm-referenced and clinical profiles are available for the groups stated above.

Reliability: Not reported.

Validity: Not reported.

Strengths: Useful tool to gain the perspective of the child or parent on the child's physical and psychosocial health.

Weaknesses: This measure is primarily a research tool and so it takes some time to become accustomed to its application. It has complex scoring system and the manual is extensive. Further testing of validity and reliability in the clinical setting is required.

Clinical utility: May be appropriate for research physiotherapists wishing to seek clarification of the child's or parent's perspective on health and well-being. Clinical physiotherapists would tend to ask pertinent questions from a family and child rather than use this weighty measurement tool.

CYSTIC FIBROSIS QUESTIONNAIRE

Source: Quittner AL, Buu A, Watrous M, Davis M 2000 *CFQ Cystic Fibrosis Questionnaire: A Health-Related Quality of Life Measure*. User manual. English version 1.0 (2000).

Purpose: Designed to measure the physical, emotional and social impact of cystic fibrosis on individuals and their families.

Groups tested: Children with cystic fibrosis between the ages of 6 and 13 and their parents, adolescents and adults with cystic fibrosis (14 years and older).

Description: There are three versions of the CFQ: a teen adult version (CFQ 14+), a parent version (CFQ-PT) and a child version (CFQ-C). Each version is developmentally appropriate and can be self-administered or used in an interview format. A range of items are rated on a four-point scale of frequency (always – never) difficulty (a lot – no difficulty) and true – false ratings (very true – very false) or weighted statements on a four- or five-point scale. Each version takes an average of 20 minutes to complete. At least two-thirds of the items must be completed to enable scoring.

Reliability: Internal consistency good = 0.7–0.9, test – retest not reported.

Validity: Good.

Strengths: A valuable tool in seeking the perception of children, adults and carers with regard to the complex health and well-being issue of patients with cystic fibrosis.

Weaknesses: Validity and reliability require further investigation. Children and adults with lower levels of English may find the self-administered questionnaire difficult to complete.

Clinical utility: A relatively quick and comprehensive measurement tool, able to be given to respondents prior to clinical assessment to complete the larger picture of their quality of life.

PEDIATRIC EVALUATION OF DISABILITY INVENTORY (PEDI)

Source: Harcourt Assessment, Halley Court, Jordan Hill, Oxford. OX2 8EJ. www.harcourt-uk.com.

Purpose: Evaluative measure of ability and activities of daily living via interview.

Groups tested: Children with physical or physical and cognitive disabilities. Test has been used in studies of children with orthopaedic and neurological problems. Applicable to children from 6 months to 7½ years, although it can be used for older children who are functionally delayed.

Description: A standardized structured interview for use with parents or professionals working with young children who are asked to give their impression of the child's typical performance. Divided into scales of functional skills, care-giver assistance and modifications. Scales can be collectively or independently administered. Each scale considers abilities in self-care, mobility and social function. Administration takes between 20 minutes and 1 hour depending upon the child's level of ability.

Standardization: Standardized scores from a normal population of children can be used for norm-referencing. Manual and scoring information gives clear guidance for standardizing administration.

- **Reliability:** Internal reliability and test – retest reliability is high: = >0.9. Interrater reliability ranges from poor to high, with particularly low intra-class correlation (ICC) scores reported between some parent and professional impressions.
- **Validity:** Good.

Strengths: Measures important constructs of life skills via interview. Can be used in any setting. Easy to administer with clear instructions.

Weaknesses: Complex to interpret. Reported involvement may give opportunity for bias or disagreement of perceptions.

Clinical utility: Clinically appropriate tool for investigation of the amount of assistance a child may need in functional activity and social interactions.

GROSS MOTOR FUNCTION MEASURE (GMFM)

Source: Cambridge University Press: www.cup.org.

Purpose: To assess change in gross motor function for children with disabilities.

Groups tested: Children with cerebral palsy, Down's syndrome, osteogenesis imperfecta, developmental delay. The GMFM-66 has been specifically weighted for use with children with cerebral palsy.

Description: A criterion-referenced measure. The original GMFM-88 has 88 items arranged into five dimensions. The newer GMFM 66 has 66 items in one dimension. The items consist of observation of the performance of a standardized physical task. Each item is assigned a score on a four-point scale (0–3).

Standardization: Each item is clearly described and standardized performance outcome descriptors assist with scoring. An extensive manual supports the assessor.

Reliability: High to good.

Validity: High to good.

Strengths: A commonly used measurement tool for children with cerebral palsy. The GMFM-66 is quicker to administer due to having fewer items and allows for interval scale measures rather than ordinal scale measure, thereby enabling a higher level of statistical analysis.

Weaknesses: Some indication of ceiling and floor effects leading to a higher level of error near the upper and lower limits of the measure. Standardized equipment is required, which may make this measure unsuitable for the community environment.

Clinical utility: A well-respected and well-used measurement tool.