

The advent of clinical governance has refocused clinicians on the need to use evidence-based practice, one aspect of which is the identification and measurement of intervention outcomes. Paediatric occupational therapists have traditionally used a variety of standardised tests in their practice and these are often cited as the means by which treatment outcomes are evaluated. However, the tests most frequently used may not be the most appropriate measures of the outcome of occupational therapy.

This paper explores some of the issues surrounding outcome measurement in the field of paediatrics and highlights aspects of outcome measurement requiring further clinical and research consideration. It is suggested that there is a need to develop a conceptual framework for outcome evaluation which is both consistent with the occupational focus of practice and uses outcome tools that are objective, useful and appropriate.

Standardised Tests: an Appropriate Way to Measure the Outcome of Paediatric Occupational Therapy?

Sally Payne

Introduction

Paediatric occupational therapists use a wide range of standardised assessments in their work (Rodger 1994, Burtner et al 1997, Chu and Chia 1997) and these are increasingly being cited as the means by which the outcomes of interventions are evaluated (Jackson 1998). This paper discusses the need for and challenge of outcome measurement faced by paediatric occupational therapists and explores the means by which therapists try to measure the outcomes of their interventions. Practice is examined to establish whether the standardised tests frequently cited by paediatric occupational therapists are, in fact, appropriate measures of the outcomes of interventions. The implications for the future of outcome measurement in paediatric occupational therapy are discussed.

Outcome measurement

Why measure outcomes?

Quality has been placed 'at the top of the NHS agenda' (Department of Health 1998, p6) and health services are now required to be accountable for the standards, efficiency and effectiveness of their actions. Outcome measures are one way of assessing the quality of a service (Donabedian 1980, cited in Øvretveit 1998), that is, proving that the service achieves the desired result for the identified population and monitoring whether resources are being used appropriately.

The need to justify and be accountable for practice has resulted in the development of clinical guidelines and

standards of care in occupational therapy (Cohn and Cermak 1998). Outcome data should both inform the development of guidelines by identifying best practice and provide one means by which services can monitor the achievement of standards of care. Clinical guidelines and outcome data can also be useful in influencing health care policies (local and national) through the education of policy makers about the scope and relevance of occupational therapy for different client groups.

Outcome data can provide invaluable feedback to inform clinical practice and decision making (French 1995) when incorporated into the clinical reasoning process. On a larger scale, outcome data can help to determine the effect of overall care on all clients receiving a type of therapy. They also allow comparisons to be made between relative outcomes in a group of individuals to see who benefits the most or the least from the services provided (Chesson et al 1996). The different variables that affect a client's outcome can be explored, so that beneficial interventions can be replicated to achieve similar outcomes with other groups of clients (Holm 2000). Outcome data may also be used within departments to monitor staff competency and to identify training needs.

Outcome data can benefit service users. Families have an expectation that the services they receive will be appropriate to their health care needs and that the choice of interventions made by professionals on their behalf is based on scientific evidence or a consensus of expert opinion (Rogers and Holm 1994). In the long term, families want the best possible treatment outcome for their children: outcome information empowers families to make choices about

different treatment options and service providers (Romain 1993). If orthodox health services are not able to provide evidence about the effectiveness of interventions, families may themselves supplement services with therapies that are expensive and of doubtful validity (Bax 2001). Health services, therefore, have a duty to improve accountability to both families and health service commissioners through the measurement of treatment outcomes.

It is essential, however, that the outcome methods chosen by occupational therapists are credible, measure what the intervention is targeted to change and reflect occupational therapy belief systems.

The problem of outcome measurement in paediatrics

Bower and McLellan (1994) described the particular challenges of attempting to measure the outcomes of interventions in paediatrics. In some conditions, physical abilities and disabilities vary owing to the child's growth or development, rather than the pathology, and the potential for change in each individual child is variable. There are few guidelines to suggest what outcomes may be predicted or simple physiological norms by which to define the outcome that is optimal for all children. There is also the difficulty of not having a premorbid state with which to compare outcomes or to use as a baseline. In addition, children often receive a variety of therapeutic inputs simultaneously and it is difficult to attribute change to one intervention as opposed to another (Wilkins 1995). Other factors, such as the child's and family's cultural belief systems and environmental contexts and their compliance with treatment, also affect intervention outcomes. Many of these variables are not within the control of the therapist.

One of the most significant factors affecting the use of outcome measures within therapy departments identified by Chesson et al (1996) was the lack of valid and reliable tools: paediatric therapists, in particular, felt that the availability of appropriate tools was very restricted. More recently, McBurney (2000, p32) found 'little published material on outcome measures in the field of paediatric occupational therapy'. As a result, paediatric occupational therapists have resorted to devising their own tools for measuring outcomes or have used existing assessment measures and readministered these after a course of therapy.

How do paediatric occupational therapists measure the outcomes of their interventions?

Two approaches were used to identify how occupational therapists evaluate the outcomes of their interventions in practice. First, in order to gain a snapshot of current practice, articles in the National Association of Paediatric Occupational Therapists' (NAPOT's) journals from Spring 1998 to Autumn 2000 were reviewed to see what methods were used by the authors to evaluate interventions. The

NAPOT Journal encourages members to share good practice and is, therefore, more likely to represent everyday practice in paediatric occupational therapy than to report specific research projects. Secondly, a convenience sample of NAPOT members in the West Midlands who attended a study day in February 2001 was surveyed to identify the use of standardised tests and outcome measures in their departments. Twelve occupational therapists from nine paediatric departments were present at the study day. No social services or paediatric mental health department was represented owing to the nature of the study day.

Of the nine departments represented at the NAPOT study day, five were not formally measuring the outcomes of their interventions. Four of these were developing or looking for an appropriate measure and the fifth was in the middle of management changes so outcomes were not a priority at the time. Those departments that were gathering outcome data were doing this for individual children; only one was looking more systematically at the functional effects of interventions for groups of children.

Of those departments that were measuring outcomes, standardised tests were the method most frequently used. The other tools for measuring outcomes were the TELER system (Le Roux 1993), an adapted version of the Westcotes/Trent Binary System (Eames et al 2000) and a departmental system looking at functional outcomes of, for example, dressing skills.

Non-standardised measures of outcome

Three *NAPOT Journal* authors who reviewed the practice of occupational therapists with particular groups of children (Buhagiar 1998, High 1998, O'Rafferty 1998) expressed concern at the limited use of standardised outcome measures, as identified in the literature and by the respondents in their studies. In the study of occupational therapy for children with pervasive disorders by O'Rafferty (1998), 50% of the respondents chose parental feedback as a means of evaluating their treatment. The author stated that this form of evaluation should be viewed with caution because service recipients may report positively in order to ensure that the treatment is continued.

Non-standardised measures of intervention outcome have been criticised by several authors for a variety of reasons. Chesson et al (1996) advised against developing systems locally and expressed concern that 'the use of unreliable instruments to measure outcomes is likely to seriously diminish the credibility of the profession' (p678). De Clive-Lowe (1996) also suggested that subjective estimations of the effect of intervention on a client, made by a clinician who has invested time and effort in treating the individual, are likely to be unreliable. There are also serious ethical implications in making treatment decisions on the basis of 'questionable assessment data', that is, those gathered by non-standardised assessments (Chia 1996, p364).

Use of standardised tests to measure outcomes in practice

In an exploratory survey of the assessment procedures adopted by paediatric occupational therapists (Jackson

1998), 44% of the population interviewed stated that outcome measurement was a benefit of using standardised tests during the assessment process. The review of the *NAPOT Journal* 1998-2000 identified a variety of standardised tests that were used to evaluate the effectiveness of treatments. These included the Movement Assessment Battery for Children (Movement ABC) (Henderson and Sugden 1992); the Developmental Test of Visual Motor Integration (VMI) (Beery 1997, High 1998, McBurney 2000); and the Draw a Person Test (Naglieri 1988, High 1998).

All nine departments represented at the NAPOT study day used standardised tests in their work with children, although one department did so only occasionally. The most frequently used tests were the Movement ABC and the Goodenough-Harris Drawing Test (Goodenough and Harris 1963), followed by the Test of Visual Perceptual Skills (TVPS) (Gardner 1996) and the VMI. One department had recently purchased a copy of the Pediatric Evaluation of Disability Inventory (PEDI) (Haley et al 1992). Nine of the 12 therapists had received no training in the administration and scoring of the tests they were using and one other said that a little training was included in an introduction to paediatrics course. One therapist had attended the College of Occupational Therapists' standardised assessment course and another was due to do so soon; several therapists said that others in their department had already been on this course. One therapist had received training in the administration and interpretation of the Sensory Integration and Praxis Tests (SIPT) (Ayres 1989).

Four departments did not collect the results of standardised tests in a systematic way to demonstrate the outcomes of their interventions. Others used test/re-test scores from the Movement ABC and/or the Bruininks-Osteretsky Test of Motor Proficiency (BOTOMP) (Bruininks 1978) to measure the outcomes of individual and/or group interventions.

Standardised tests as measures of outcome

Standardised tests have set procedures for administration and scoring. They provide precise measurements of a child's performance in specific areas and usually describe this performance as a standard score (Case-Smith 2001). Standardised tests should 'objectify our clinical judgements' (Wilson et al 1995, p9). Chu and Chia (1997) identified eight norm-referenced tests commonly used by paediatric occupational therapists in the United Kingdom; these included the five tests identified as being used by NAPOT members in the survey described above. All the tests were standardised in North America or Canada and the authors urged caution in interpreting the results based on these norms for British children.

Law (1987, cited in Wilson et al 1995) categorised measurement instruments as being descriptive (useful for diagnosis) and evaluative (useful in quantifying changes in a person over time). However, not all the tools used by

paediatric occupational therapists were developed as evaluative measures and their use in this way must be considered carefully. Anecdotal evidence suggests that clinicians have already identified problems in using the Movement ABC to evaluate progress if the children move across an age-band between assessments.

Wilson et al (1995) examined the BOTOMP as an evaluative tool. They concluded that, like most other tests used in therapy and education, there was little evidence to support the use of the BOTOMP to measure change over time. Indeed, normative scores might only show change if the child did not change age-band between assessments or if a child's rate of change was 'faster than typical maturation which is a rate of progress that few children with mild motor problems are able to achieve' (p15). They suggested that for treatment outcome purposes, it is more useful to compare a child's performance with his or her previous performance (point or raw scores) than with a normative sample (standard scores). This conclusion may also be applied to other norm-referenced tests commonly used by paediatric occupational therapists. Similarly, Burtner et al (1997) found little evidence to support the use of visual perceptual tests with children for prediction and evaluation of change over time.

There seems to be no doubt of the usefulness of standardised tools, compared with non-standardised measures, in providing an objective measure of effectiveness (de Clive-Lowe 1996). However, the measures chosen must be used appropriately and be suitable for the purpose for which they were developed (Øvretveit 1998). There is a danger that the overuse of discriminative (diagnostic) measures in reporting treatment outcomes will narrow awareness amongst others (including non-clinical people) of the wider role of the paediatric occupational therapist. Indeed, if outcome data help to clarify what health care providers are actually doing in clinical practice (Ellenberg 1996), paediatric occupational therapists must ensure that the tools used effectively reflect the scope of their practice.

Standardised tests have been criticised as being an inappropriate substitute for functional assessment (Case-Smith 2001). Most standardised tests, including those most frequently used by the therapists surveyed in February 2001, assess performance components (such as balance, visual motor skills and visual perceptual skills) rather than actual performance in occupational areas (for example, play, self-care activities and educational productivity). Cohn and Cermak (1998, p540) stated that 'the outcome assessment used by therapists [should] reflect our belief systems and the assumptions about behaviours we expect to change'. If the standardised tests identified above are the only measures used to demonstrate the outcomes of interventions, the profession is in danger of failing to convey adequately to clients and others the importance or relevance of occupational therapy to daily life (Trombly 1993).

There is also the danger that using standardised tests that have been developed by people outside the profession will result in confusion among families and other professionals about the role of the occupational therapist (Fisher 1992). If occupational therapists are unable to demonstrate the

uniqueness of their role, there is a risk that the profession will become marginalised in a health care environment where services have to justify their existence and credibility.

Functional outcome measures

Malloy-Miller (1995) suggested that functional outcome measures may be more useful than the BOTOMP in evaluating change following occupational therapy. This would certainly seem to be more congruent with the professional focus on occupation. However, to maintain credibility and to ensure that treatment decisions made on the basis of these assessments are ethical, the functional measures must also be standardised. There are a small number of tools that have been developed specifically for use with children with physical difficulties which may be considered appropriate evaluative tools for occupational therapists.

The PEDI (Haley et al 1992) was developed as a standardised tool to identify and measure function in children between the ages of 6 months and 7 years 6 months. It was also intended to be used to monitor change in individuals and groups of children and to examine the outcomes of individual and group intervention programmes for children with disabilities (Coster 1999). There are concerns that the PEDI can be time consuming to administer and score (Knox and Usen 2000) and that once a certain level of competence has been achieved no more data are collected regarding quality changes, for example improvements in accuracy or speed (Case-Smith 1996). However, the PEDI does provide useful information about what a child is able to do in his or her own context and the level of assistance or environmental modifications required to perform a functional task. The PEDI has been used by many researchers to examine the effectiveness of a variety of intervention programmes (for example, Case-Smith [1996] and Nordmark et al [2000]) and is useful in capturing and communicating an occupational perspective (Coster 1998).

The School Function Assessment (Coster et al 1998) is a more recently developed criterion-referenced tool for use with children between the ages of 5 and 12 years. It approaches evaluation from the top down (Trombly 1993) and starts by looking at a child's pattern of participation in school activities and environments that are typical of peers in the same context (Coster 1998). The level of assistance and adaptation required for a child to perform a task at school is rated and the specific activity performance is evaluated where appropriate. The Assessment of Motor and Process Skills is another tool that has been developed by an occupational therapist and has recently been adapted for use with school children. It uses performance analysis and incorporates tasks that are meaningful and familiar to the child, such as writing, dressing and self-care skills (Chard and Thomas 2000).

Case-Smith (2001, p242) described these types of assessment as a 'new wave of tests designed by and for occupational and physical therapists [that] show promise in

addressing the specific assessment and programme-planning needs of paediatric therapists'. Occupational therapists who use these tools can measure the outcomes of their interventions objectively and will find it easier to communicate the occupational therapy perspective to children, families and other professionals.

A conceptual framework for outcome evaluation

Cohn and Cermak (1998) proposed the development of a conceptual framework for outcome research that was consistent with the professional focus on occupational functioning proposed by Trombly (1993, 1995). After reviewing the literature for evidence of the outcome of sensory integration therapy, they concluded that 'by focusing primarily on the underlying components of performance of children, occupational therapists have neglected to explore how sensory integration affects the everyday occupation of children' (Cohn and Cermak 1998, p540). This is true of many other approaches to paediatric occupational therapy.

Cohn and Cermak (1998) suggested basing a framework for outcome evaluation on the top-down model of occupation-centred assessment of children developed by Coster (1998). Therapists should measure changes in the extent to which children are typically able to 'engage in activities that are available to and expected of peers in the same context' (Coster 1998, p341). Within such a framework, there would be a shift away from the measurement of changes in 'impairment' or 'deficit' (which is what many of the standardised tests currently used by paediatric occupational therapists measure) towards a functional and social participation perspective. Changes in test scores should be regarded as meaningful only if they are indicative of changes in everyday performance and demonstrate changes in the areas of intervention that were targeted by the therapy.

It is also important to consider client-centred aspects of outcome evaluation. By understanding the child's and family's points of view and the outcomes that children and families value, therapists will ensure that intervention programmes focus on individual needs and desires. This will help to demonstrate further the relevance of therapy to everyday life.

Conclusion

Paediatric occupational therapists have a long history of using standardised test procedures. Their use can help to present clear and objective data on the outcomes of interventions and to make comparisons between different types of intervention in order that best practice can be identified. However, the continued and almost exclusive use of standardised tests that measure performance components to demonstrate treatment outcomes is of significant concern.

Paediatric occupational therapists need to adopt a conceptual framework of outcome evaluation that is consistent with an occupation-focused approach. Not only would this help to demonstrate to others the value and role of paediatric occupational therapy, but it would also encourage a shift from component-driven practice to a top-down approach to intervention.

Paediatric occupational therapists must ensure that the outcome tools used are appropriate to evaluate change over time. There is clearly a need for these tools to be standardised, valid and reliable, in order that scientific and credible comparisons can be made between outcomes for individuals and groups (de Clive Lowe 1996). Wilson et al (1995, p15), however, suggested: 'Although standardised tests are widely used to measure progress and study treatment efficacy, other measurement methods, such as functional performance outcomes, may provide useful information.' Fortunately, it is now becoming possible for paediatric occupational therapists to use assessment tools that are standardised, have been developed as evaluative tools and measure changes in function and occupational performance. However, there is still a lack of tools available to measure objectively the occupational outcome of intervention with certain groups of children, including those who have a perceptuomotor or attention deficit disorder. The development of these will require multicentre cooperation in order to produce tools that are 'good in concept' and 'meaningful in practice' (Coster 1998, p343).

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Author

Sally Payne, BSc(Hons), DipCOT, SROT, Senior Occupational Therapist, Birmingham Children's Hospital NHS Trust. Correspondence to: The Child and Family Centre, 142 Maas Road, Northfield, Birmingham B31 2PR.