

EDITORIAL

Outcome Measures in Rehabilitation

Outcome measures have an important place in rehabilitation both in clinical practice and in research. There are many instruments to choose between, as exemplified in a recent survey of commonly used instruments for outcome in Europe (1). It is of the utmost importance to be clear about why to measure, what to measure and then decide how to measure. A strategy that is suitable for research may not always be suitable in clinical work.

In recent issues of *Journal of Rehabilitation Medicine* we have been fortunate to have a number of papers and reports of high relevance for outcome measures, and further papers are in the pipeline. It is important to have a conceptual framework that is generally accepted. The previous International Classification of Impairments, Disabilities and Handicaps (ICIDH) published in 1980 by WHO has had a great impact and has been used as a conceptual framework for many studies. Other instruments have also been developed based on for instance the handicap concept. In May 2001, WHO approved the International Classification of Functioning, Disability and Health (ICF) introducing a number of new concepts, specially using positive terms; using *Participation* instead of *Handicap* and allowing for the possibility to consider the Environmental factors more in depth. In our journal, ICF has been announced in a previous Editorial (2), and was in our previous September issue, (September 2002) presented more in detail in a review by Tora Dahl who works at the Nordic Classification Centre (3).

One of the challenges when implementing ICF is to incorporate various well-trying and newly constructed instruments, which has also been discussed in a Special Report by Gerold Stucki and co-workers (4). It appears also from other reports, for instance in the PRO-ESOR project (1), that most items in commonly used instruments in rehabilitation can be coded using ICF. This would be one of the first practical uses of ICF in outcome research (beside its use as a conceptual framework replacing ICIDH) and we encourage authors submitting papers to *Journal of Rehabilitation Medicine* to consider this.

It is an advantage if an instrument falls completely within one of the Dimensions of ICF: *Impairment*, *Activity limitation* or *Participation restriction* as a comparison of the impact on these different dimensions can then be made; also, it becomes more evident what the effect of a particular intervention is. There are, however, aspects of importance in outcome research which are not covered by the ICF framework, e.g. quality of life, life satisfaction, various standard outcome end points such as mortality, morbidity, work status, social conditions etc.

By tradition, in medicine many methods for analysing outcome are within the *Body function* (negative aspects being *Impairments*). Many of them, but not all, can be measured with

variables on a linear scale (ratio or interval scale), such as weight, length, force, time, temperature, pressure, and for them ordinary statistics can be used. Still, we would encourage the use of a statistical consultant both when designing the study and in analysing the data.

Within the Impairment area (e.g. pain scales) and in most assessments of *Activity* (Activity limitation) and *Participation* (Participation limitation), however, scales with ordered categories (ordinal scales) are used. They require another type of statistics as has been pointed out in recent years by a number of scientists in rehabilitation (e.g. 5, 6). In essence they have pointed out that those instruments generate ordered categorical data, which have no metric properties, and should not, although they often are, be subjected to calculations such as addition and subtraction. Sum of raw scores may only be accepted as a rough way to present data, but should only be used with great caution. There are several ways to treat such data; one which has been much appreciated is the Rasch analysis, based on the theories from the 1960s by the Danish mathematician Georg Rasch. It is one of the latent trait approaches to categorical data and has been fruitfully used in rehabilitation studies; see for example a rehabilitation-oriented description by Luigi Tesio et al. (7). The merits of the Rasch analysis is to provide numerical data, within a probabilistic framework, with the same metric system (ruler) for item difficulty as for person ability. It furthermore tests unidimensionality and can be used to compare item location on the metric scale from various subsamples (differential item functioning). It has been widely used in rehabilitation research, particularly in the USA, but also in studies of European origin, some of which have been published in *Journal of Rehabilitation Medicine* (8, 9). Recently, McHorney (10) published an interesting report on a slightly different approach based on the Item Response Theory (IRT) but also using the probabilistic framework and provided evidence to overcome test dependence and place items from different instruments on a common metric scale, also taking the discriminatory power of the items into account. In that paper the value and importance of creating "Rehabits" (rehabilitation measurement units) by linking procedure was discussed, a topic that has been proposed even by other authors.

A different approach using the rank-invariant method has been advocated by the Swedish statistician Elisabeth Svensson and recently used in a number of studies related to rehabilitation, one of which is published in this issue (11). The readers are referred to that paper for further explanation and examples of its use. It is especially useful for paired ordered categorical data as seen also in other studies published in our journal and has been demonstrated to be of value for the validation of ADL

instruments also with different numbers of response values. It discriminates between systematic and random variation between samples of data.

To summarize, it is important when doing outcome research using ordinal scale – as is often the case in rehabilitation – to be aware not only about how relevant the instrument is for the purpose of the study and how well it will target the variation in performance or capacity of the subjects being studied, but also to use theoretical solidly based methods for the analysis. Special advice from researchers trained in such techniques is recommended.

Another important approach in studies in rehabilitation medicine is to use qualitative methods, for which several techniques have been described. Publication of such studies are encouraged. From deep interviews an understanding of various phenomenon may be achieved. Relevant problems from the patient or a professional point of view may be described which would otherwise have been lost using only quantitative methods. Further studies using a quantitative approach may then be possible.

IMPACT FACTOR

The impact factor has roused a great deal of interest in scientific publication, but has at the same time been criticized. In a previous Editorial (12), the impact factor was described, being the number of references made in one particular year (e.g. 2001) from papers published during the previous two years (1999 and 2000) divided by the total number of papers published during those years. Such calculations are of course likely to be affected by random factors, especially in a small journal with a limited number of published papers per year, which was the case for our journal in 1999 and 2000, i.e. before the number of issues was increased to 6 and the format made bigger. It is therefore a great pleasure to announce that our impact factor for the year 2001, based on the number of citations from the 1999 and 2000 issues, has increased to 1.101 from 0.808 in 2000. In comparison with the impact factor for other officially related journals in "Physical and Rehabilitation Medicine" for 2001 we are now listed as number 2 in the world, as seen below:

Arch Phys Med Rehab	1.371
Scand J Rehabil Med	1.101
Am J Phys Med Rehab	1.006
Clin Rehabil	1.000
Disabil Rehabil	0.683

It should be noted that the impact factor is given under the name

Scandinavian Journal of Rehabilitation Medicine as the new name *Journal of Rehabilitation Medicine* only has been in use from 2001. However, as you have probably noticed, the journal has maintained its editorial policy, and kept its Editor and Editorial office, and so the recent impact factor is fully relevant for the journal even with its new name. With an increasing international audience both when it comes to authors and readers it is our hope that the impact factor will increase further.

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