Assessment of Goal Attainment Scaling in the Community Based Rehabilitation Setting: A Pilot Study

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ABSTRACT

Background: Outcome measures in physiotherapy are multi dimensional hence, may not estimate the individualized goals of patients with varying complaints. To make a quantitative, individual assessment of patients in a community is even more challenging. Therefore, assessment measure such as goal attainment scaling (GAS) acts as a better tool of measurement.

Objective: To assess feasibility of goal attainment scaling (GAS) as used by physiotherapists in a community based rehabilitation setting.

Method: This is a quantitative pilot study with pre and post intervention data evaluation using GAS. The author selected 10 consecutive patients, of different diagnosis, from referred patients waiting list and handed over to physiotherapists who gave informed consent to apply GAS scale.

Results: A total of 10 patients data were collected. The mean age of patients was 80.4 years. Patients with lower quadrant complaints showed a marked improved in GAS scores. A total of 19 goals were identified, out of which 8 goals were achieved at expected level; 6 failed to reach the expected level and 5 were superseded the expected level of performance. Feedback from physiotherapists suggested that GAS is a useful measure for community based rehabilitation (CBR) in a low income setting.

Conclusion: GAS proves to be a responsive measure in CBR setting. GAS provides clarity of goals for the physiotherapists, patients and hence,their families. GAS seems to have good psychometric properties but the concern with its use is therapist may set goals which are too easy to achieve for the patient. Further research is required to investigate its feasibility of GAS in Pakistan.

Key words: Outcome measure, goal attainment scaling, community based rehabilitation.

INTRODUCTION

In current financial situation there has been increased in responsibility on the shoulders of therapists and other health care professionals to evaluate and prove the effectiveness of the physiotherapy services. In clinical practice therapists are using different tools as an outcome measure. An outcome measure is quantification of an outcome. Austin *et al.*[1] described the outcome measure as a phrase used to indicate the process of documentation of client improvement and achievement of treatment goals. In current practice of multidisciplinary rehabilitation, measurement of outcome can be problematic. Outcome measures in physiotherapy may be ranked in units too general and may not detect individual patients assessment according to their needs based on their medical condition. Other measures may have "floor" and "ceiling effects" with reduced responsiveness. For example the limitations of Barthel Index (BI) are the 'ceiling and floor effect' that is the maximum range of behaviours measured does not include the full range of patient's behavioural changes that can occur along the course of rehabilitation.[2] Some functional changes may occur outside the assessment potential allowed by the measure and thus will be detected or failed to be examined. Another example is of the widely used measure known as berg balance scale. The problem with this measure is that it is hard to apply in the early stages of ischemic stroke as many stroke patients may not regain their ability to sit independently or sit to stand leading to

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floor effects. Evaluation of community based rehabilitation is challenging to therapists, this process consist of physical, psychosocial, home coping, return to work and participate in wider social activities. Due to these complexities it can be difficult to measure improvements and benefits of the service.[3] An outcome measure in the community based setting should be able to assess the patients regardless of their diagnosis. Several outcome measures exist, however, it has been noted that outcome measures may fail to capture full picture of patient's needs and has limited individuality. The evaluation is even more complex in elderly population and there is a need for an individualised measure to be used during the rehabilitation process. One such measure is known as goal attainment scaling (GAS). Kiresuk and Sherman[4] developed GAS in 1968, refers to a process of evaluating therapeutic outcomes with patients. GAS is a measure that quantifies the achievement of specific goal of treatment of individual patient, known as behavioural objectives.

Goal Attainment Scaling has proven to be useful in measuring clinically important changes in rehabilitation setting. Rockwood et al.[5] reported responsiveness of GAS in frail elderly patients. Results of this small sample size study revealed that GAS was more responsive to patient's progress or decline in improvement as compared to Barthel index, the functional independence measure, the Physical Self-Maintenance Scale, the Katz Activities of Daily Living Index and the Spitzer Quality of Life Index. Rockwood et al.[6] further explored the responsiveness of GAS in a large sample size study and compared the responsiveness of GAS with Barthel Index, Physical Self-Maintenance Scale, modified Spitzer Quality of Life Index and Instrumental Activities of Daily Living. They found that GAS was significantly responsive as compared to other measures. Although the author attempted to ensure blinding in this randomised controlled study, however, no explanation was given about the patients who dropped out from the study, making the statistical analysis weaker. Several other studies,[7-8] have reported the responsiveness of GAS.

The inter-ratter reliability of GAS was first examined by Goodyear and Bitter.[9] In this neurological rehabilitation setting study they found good inter-ratter reliability for the majority of ratters. This is supported by Stolee et al.[10] small sample size retrospective study looking at reliability and usefulness of goal attainment scaling in the geriatric setting. Stolee et al.[11] took one step further and investigated the reliability of GAS in a large sample size. Results suggested that inter-ratter reliability score of the GAS discharge score was 0.93 showing strong inter-ratter reliability of GAS. In contrast, Rushton and Miller[12] failed to report inter-ratter of GAS; this study differs from other studies and was conducted in an amputee rehabilitation setting with young subjects.

Validity of GAS has been reported in the literature. Psllsano[7] investigated the validity of GAS in 21 infants with motor delays. The assessment of content validity was carried out on the dimensions, the importance of the goal, whether it is achievable and whether each level of change was clinically important. Results revealed that criteria for content validity met in all areas of concern amongst the therapists. Even though the sample size was small, yet results showed significant validity. Stolee et al.[11] investigated the validity of goal attainment scaling in geriatric rehabilitation setting in a large sample size. In this 173 subjects study goal attainment scaling, self-rated health, a global clinical assessment, the Barthel Index, the OARS IADL scale, the Folestein Mini-Mental State Examination (MMSE), and the Nottingham Health profile (NHP) were used. Results suggested that there was strong correlation between GAS score and other outcome measure scores except for self-rated health, the MMSE and the NHP. There is a need to assess individualised measure applicable in community based rehabilitation setting. Therefore GAS was chosen for evaluation in community physiotherapy setting.

Rationale: The use of patient's goals as an outcome measure in not new and the literature highlights its use in clinical practice. Goal Attainment scaling (GAS) is one of the important outcome measures used in rehabilitation setting; however there is no recent work highlighting its use in community rehabilitation setting. Therefore the author choose to assess its use in community rehabilitation setting.

OBJECTIVE

To assess feasibility of goal attainment scaling (GAS) as used by physiotherapists in a community based rehabilitation setting.

METHOD & SETTING

The study was carried out in Sheffield PCT .Sheffield is the 3rd largest city of England with the population of 555,5000. Sheffield NHS Primary Care Trust has more than 50 therapists who provide various community based physiotherapy services in the whole of the city such as home based physiotherapy, pulmonary rehabilitation, cardiac rehabilitation and other intermediate care rehabilitation services for facilitation of early hospital discharges. This study was based at the East of the city which is a relatively deprived population area as compared to other areas of Sheffield.

5 senior physiotherapists in Sheffield PCT community physiotherapy services were requested to complete pre and post treatment GAS scores. Pre and post intervention data was collected by a single (treating) physiotherapist.

Duration of the study: This study was carried out between March to June 2009.

Sample size: 10 consecutive patients, of different diagnosis, from referred patient's waiting list were selected and handed over to physiotherapists who gave informed consent to apply GAS scale.

Inclusion criteria: Elderly patients, Different diagnosis, Patients triaged by senior physiotherapist and were suitable for community based rehabilitation.

Exclusion Criterion: Patients who refused to give informed consent, Patients who had co morbidities such as cancer, acute trauma, severe pulmonary or cardiac disease which may have a negative impact on rehabilitation.

Informed verbal consent: Informed verbal consent was obtained from all patients involved in this study. Those who did not give consent were not included in the study.

Tool for Data Collection: Feedback from physiotherapists was collected on a structured questionnaire consisted of questions about time, applicability of the measure in community based rehabilitation setting, measured sensitivity and training issues.

Data collection: Pre and post intervention data was collected by a single treating physiotherapist, who was trained to collect the data. This was done to eliminate data recording bias.

Five senior physiotherapists in Sheffield PCT community physiotherapy services were requested to complete pre and post treatment GAS scores for their patients.

Method of data collection: The therapist negotiated goals with patient and carers on a 5-point, ordinal scale of attainment with 2 levels above and 2 levels below the expected goal. GAS levels were noted and the current level of function was scored. If no clinically worse outcome was expected, the base line level of performance was scored at level -2.

Data Analysis: After the treatment administration, the rating of each level of performance was computed as GAS score. This score represents a numeric index of patient's improvement in performance of goal areas. The formula used to compute GAS score is

$$T = \frac{50 + (10 \sum x_i w_i)}{\sqrt{(1-r) \sum w^2 + r(\sum w)^2}}$$

Where X= goal and W = weight of the gaol.

Pre and post test T-scores are compared and allow judgement of the overall success or failure of the programme to be made.[5]

Table I: T scores ratings used for programme evaluation.

T-Score	Interpretation
< 50	Indicates goal attain below the expected level
50	Indicates goal attain at expected level
> 50	Indicates goal attain above the expected level

RESULTS

The mean age of the patients was 80.4 years (range 52 to 89 years, SD 11.08) with sample size of 10 including 2 males 8 females. In Community physiotherapy setting the nature of patients diagnosis are varied, which has been reflected in this study (Table II). 8 out of 10 patient's diagnoses were related to lower quadrant problems leading to decreased mobility. It was noticed that patients with lower quadrant dysfunction showed significant improvements in GAS score as compared to other diagnoses for instance, subjects 1 and 8 had shoulder and neck problems and their condition did not improve significantly (Table II). In addition, female subjects showed better results than males, although male subjects had lower quadrant problems. The numbers of goals set for each patient ranged between 1 to 4. Total number of goals set for all subjects were 19, in which 12 goals were initially set at -2 and 7 goals were set at -1 (Figure I). There was a trend noted in the level of improvement in post GAS scores as compared to base line of all patients. However, only 3 subjects showed achieving more than expected level of performance (subject 4, 5, 6) whilst 3 subjects (that is, subjects 2, 9 and 10) achieved expected level of performance. The remaining 4 subjects (1, 3, 7 and 8) failed to achieve expected level of performance (Table II). For this non-parametric data, the median of GAS is 0 (-2, -1, 0, +1, +2) demonstrating that overall goals were achieved at expected level of performance (Figure II).

Subjective report (feedback) from physiotherapists following the use of GAS: 3 of the 5 therapists who applied GAS (60%) reported that it took 5 minutes to complete one goal (3 out of 5). The usefulness of GAS in a community setting was reported by 80% of physiotherapists (4 out of 5) and 60% (3 out of 5) reported that it seemed sensitive to clinical change while 40% (2 out of 5) questioned its sensitivity and responded with a comment "it depends on how goals

Table II: Patients diagnoses, pre and post t-scores and number of goals.

Patient	Sex	Age (Years)	Diagnosis	Pre intervention	Post intervention	No of goals
1	F	81	Fall, shoulder injury	T-Score	T-Score	2
2	F	84	Fracture right neck of femur	25.90	37.95	1
3	M	86	T3/T4 Decompression	30	50	2
4	F	89	Decreased balance	29.91	41.96	1
5	F	72	Bilateral knee replacement	40	60	3
6	F	86	Fracture right Ankle	23.56	61.01	1
7	M	88	Frail elderly	40	60	2
8	F	52	Neck pain	37.95	41.96	2
9	F	85	Decreased mobility	25.90	45.98	4
10	F	81	OA(knee pain)	40	50	1
		Mean = 80.4		30.39	51.40	Total=19

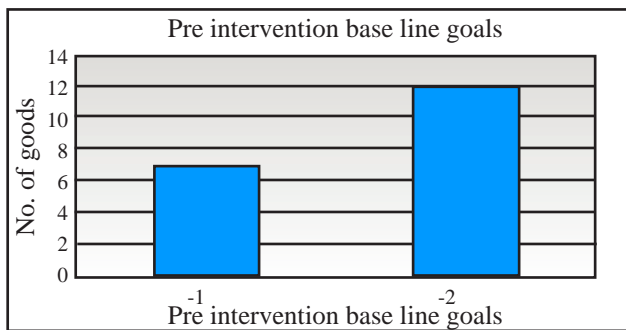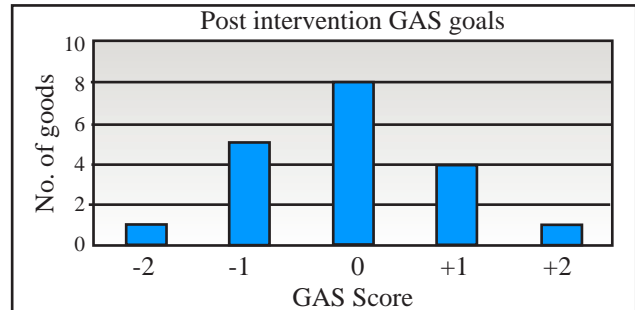Figure I: Pre intervention base line goals

Figure II: Post intervention GAS goals

are set". All 5 physiotherapists thought using GAS needed training and becomes easier after a 2 hour training session by someone who knows how to use GAS.

DISCUSSION

The results of this study revealed that GAS is a responsive outcome measure to detect clinically important change in community physiotherapy setting. All subjects showed change in pre and post GAS scores. Several studies have described GAS in rehabilitation programmes[11,12] however, these programmes explained its use in patients with comparable diagnosis and none of these programmes were community based programmes. These studies revealed GAS advantages including its importance in measuring patient's progress, planning, making decisions and communicating with families. In our study, 42% patients achieved expected level of outcomes, 26% above expected level and 32% failed to achieve the expected level of performance. In contrast Natasha[13] work reported that 53% patients achieved expected level of performance with 33% achieving above expected level and only 14% achieved below expected level of performance. Natasha[18] study applied similar methodology. The current study has been carried out in community physiotherapy setting

with older subjects with a mean age of 84.4 years and with varying diagnosis patients. Natasha[13] study was carried out in community occupational therapy setting with relatively younger subjects with a mean age of 56.5 years and the common diagnosis was acquired brain injury. Moreover, the subjects were discharged from the hospital. The present study had a smaller sample size and a total of 19 goals were set whereas in Natasha[13] study 36 goals were identified by the therapists. In present study the common diagnosis was decreased mobility and patients with lower quadrant problems significantly improved as compared to other diagnoses. This may be justified by the fact that most patients in this study had problems with lower quadrant. In addition, female subjects (80 %) in this study made better progress as compared to male subjects. It is time consuming for community physiotherapists to capture the change of their patients through a number of various measures. The present study showed that GAS is a suitable measure to capture specific change in individual patients in a meaningful way without much time being taken up. As 60% of physiotherapists reported only 5 minutes per goal. These finding are compare favourably with a study by Stolee et al.[10] who found that GAS is a feasible measure, requiring only 15-20 minutes scaling an average of six goals per patient. In this study 80%

physiotherapist reported that GAS is a useful measure for community based setting. It has been reported in the literature that GAS provided clarity for the patient and their family to better understand the likely outcomes of rehabilitation programme and their role in achieving these outcomes.[19] Several other studies Nelson and Payton[20] and Northen et al.[16] has shown the importance of patient participation in rehabilitation process and the value of outcome measure that facilitate this process. In this study 40% physiotherapists questioned the sensitivity of GAS, this subjective feedback is in contrast with mathematical outcome of patient change (Table II) where all patients outcomes showed sensitivity following the rehabilitation process. Most community physiotherapy referrals include goals and recommendations from referring therapists and this study supports the involvement of referring therapists in GAS process. This is in line with Young et al.[17] findings suggested that less detailed knowledge available regarding the patients, the more difficult it was to select and rank the goal.

One physiotherapist reported sensitivity of this measure depends on how goals are set and this problem has been highlighted by Rockwood[6] who stated that clinicians may set the goals too easy for the patient to attain. The other possible problem with GAS is its comparison is difficult because the subjectivity of the goals set by the therapist.[18] Some other problems with GAS have been reported in the literature for example assigning weight to a goal is difficult and can mislead the results.[19] In contrast when unable to decide preference for certain goals, equal weighting will loose little information.[7] All physiotherapists reported that GAS need training and will become easy to administer after training. Natasha[18] has suggested that familiarity with the goal setting improves the reliability of the goals. This is supported by Ottenbacher and Cusick[20] stated that GAS may be more reliable after clinician training in goal setting procedure. This pre and post test study shows the clinical utility of GAS in the community physiotherapy setting. It only shows patients changes over the course of rehabilitation and does not take into account other factors like concurrent treatments and natural course of recovery.

CONCLUSION

GAS appeared to be useful measure for community based rehabilitation setting among elderly patients. GAS provides clarity of goals for the physiotherapists, patients, and their carers and facilitates patient participation in the rehabilitation process. GAS does not take too much time to complete and applicable in 15-20 minutes for a patient. On the whole GAS is a descriptive outcome measure for community based rehabilitation setting.

LIMITATION

The sample size for this study was small, larger studies should be under taken to eliminate any bias. Further research is required in other community based rehabilitation services, such as intermediate care, to investigate the feasibility of GAS in these settings.

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