

**Table 4**  
Differences in staff's perceptions according to type of facility

Improved/additional resources	Perceived need	GH (N = 262) (%)	GHSF (N = 341) (%)	NH (N = 456) (%)	ANOVA
<b>Required resources</b>					
Physician or nurse available 24 h	Great	61.8	70.7	79.6	**
	Moderate	34.7	27.3	17.5	
	Minimal	2.7	2.1	2.2	
Staff education	Great	60.3	71.0	77.6	**
	Moderate	38.5	25.5	20.6	
	Minimal	0.4	3.2	0.9	
Hospital involvement (including hospice, emergency hospital)	Great	58.8	65.7	73.7	**
	Moderate	36.3	31.7	24.1	
	Minimal	4.6	2.6	1.8	
Quiet environment/private room	Great	53.1	63.0	64.0	**
	Moderate	42.7	33.7	32.5	
	Minimal	3.1	2.3	3.3	
Additional social workers/social worker time	Great	32.8	35.8	30.3	**
	Moderate	51.9	54.8	52.4	
	Minimal	14.5	7.3	15.1	
<b>Educational need</b>					
Dementia care	Great	62.6	75.1	75.7	**
	Moderate	34.0	22.3	21.3	
	Minimal	1.5	1.2	0.9	
Physical care	Great	59.9	69.5	71.9	**
	Moderate	35.9	28.4	25.0	
	Minimal	2.7	0.6	1.1	
Communication with residents and families	Great	51.9	64.2	66.9	**
	Moderate	45.4	32.3	30.3	
	Minimal	1.5	2.3	0.4	
Pain/symptom control	Great	54.6	58.4	63.8	**
	Moderate	42.0	38.1	31.8	
	Minimal	2.7	1.5	1.3	
Psychological aspects of dying	Great	51.5	62.8	65.4	**
	Moderate	43.5	32.8	30.7	
	Minimal	4.2	2.6	2.2	
Decision-making/advance directives	Great	48.5	60.1	64.0	**
	Moderate	48.9	36.7	32.7	
	Minimal	0.8	1.5	1.1	
Artificial nutrition	Great	42.7	48.1	55.3	**
	Moderate	51.1	45.7	39.7	
	Minimal	5.0	4.4	2.9	

GH = geriatric hospital, GHSF = geriatric health services facility, NH = nursing home. group differences were compared using the analysis of variance (ANOVA). \*\* $p < 0.01$ . Variables which is not  $p < 0.05$  are not shown in the table.

quiet environment/private room than GH staff, but a lower need for additional social workers/social worker time than GH staff. NH staff perceived a greater educational need for specific end-of-life care content areas: dementia care, physical care, communication with residents and families, pain/symptom control, psychological aspects of dying, decision-making, and artificial nutrition than GH staff.

#### 4. Discussions

##### 4.1. Additional resources needed for adequate end-of-life care at facility

This study indicated that nursing and caring staff recognizes a need in several areas of end-of-life care provision at their facilities, including 24-h medical service and hospital involvement. These results are consistent with those of our previous studies showing that medical support from a hospital has a positive impact on attitudes toward end-of-life care provision at facilities (Hirakawa et al., 2006, 2007a). Other papers suggested that symptom management was inadequate at long-term care facilities (Keay

et al., 2000; Zimmerman et al., 2003), and Raudonis et al. (2002) suggested that nurses at long-term care facilities were not knowledgeable about pain management. Long-term care facilities may benefit from hospital involvement, which contributes to the improvement of symptom management through experienced physicians' advice or visits. Also, the perceived need for physician or nurse available 24-h, and hospital involvement was much greater for NH caring staff than for GH staff. In general, NHs have fewer physicians or nurses than GHs. Since 24-h medical care is necessary for some end-of-life residents, the differences in availability of medical care might have affected the results.

Participants stressed the importance of staff education concerning end-of-life care. As mentioned above, long-term care facility nurses are generally poorly educated on end-of-life care (Keay et al., 2000; Raudonis et al., 2002; Zimmerman et al., 2003). The nationwide study we conducted previously suggested that staff education contributes to the improvement of end-of-life care provision at long-term care facilities (Hirakawa et al., 2007a). The present study confirms our previous results. It was impossible to determine why nurses perceived a greater need for private room than caring staff. End-of-life care is a field of practice that nurses

are often involved in, and this experience may allow them to better focus on end-of-life environment at their facilities. Our results indicate that nurses felt they lacked sufficient time to care. Our nationwide survey revealed that medical staff shortage was a possible barrier to adequate provision of end-of-life care at long-term care facilities, and that the need for medical staff was felt as greater than that for caring staff (Hirakawa et al., 2007a). Because end-of-life care provision may impose a great burden on nursing staff, policy makers or directors should address the current issue of nurses' overwork if they wish to adequately promote end-of-life care at their long-term care facilities.

This study also emphasizes the importance of hiring additional social workers or extending their hours among GHSF staff. Because GHSFs are generally regarded as a temporary or intermediate facility to enable the elderly who do not need to be hospitalized to return home, GHSF residents and families do not normally expect death to occur at GHSFs (Hirakawa et al., 2007a). Therefore, GHSF social workers should learn to deal with a wide range of social problems, including discharges or transfers.

The caring staffs' perceptions presented in this paper suggest that peer support is an area of focus for improving end-of-life care at long-term care facilities. Peer support is mutual mental support through discussion of specific topics with colleagues who share common distresses in specific areas, such as caregiver burden (Heller and Caldwell, 2006). In general, caring staff do not receive end-of-life education nor do they ever experience death (Iwasaki, 2003). Therefore, without previous training, inexperienced non-medical staff may be terribly shocked to face the death of a user (Hirakawa et al., 2006). Mutual mental support systems should focus on caring staffs' mental health. Also, respondents perceived a need for a palliative care team at their facilities. Residents entering the end-of-life phase often face psychosocial problems in addition to physical setbacks. To deal with these end-of-life problems comprehensively, we need to develop an effective strategy to provide adequate end-of-life care for the residents by integrating the knowledge of a wide variety of professionals such as physicians, nurses caring staffs, social workers, etc.

#### 4.2. Staffs' educational needs concerning end-of-life care at facility

Although the extent to which education impacts the quality of end-of-life care has not yet been determined, our results suggest that staff are eager to be educated concerning end-of-life. Because they look after residents for years, caring staff may value the relationship they develop with residents and prefer to maintain involvement and support through the whole dying process. It can thus be safe to assume that staff education programs may provide a good preliminary step toward improving the quality of institutional end-of-life care.

Although all of the educational items listed in the questionnaire were perceived as important issues among respondents, dementia care was the most frequently reported. Since dementia is related to aging, many long-term care residents suffer from it (Goodridge et al., 2005). Because the typical pattern of clinical symptoms of patients with dementia over time is different from that of non-dementia patients (Scan and Kanowski, 2001; Hart et al., 2003), nursing or caring staff should be prepared to deliver dementia-specific end-of-life care for residents. In addition, our data suggests that NH staff are more eager to learn about dementia care than GH caring staff. NH staff may have more experience dealing with residents with dementia-specific problems caused by cognitive impairment, while GH staff may be less experienced in this area because GH residents require extensive medical treatment or physically demanding care due to illness complications. Our results also suggest that long-term care staff, especially NH staff, would like to learn about the

psychological aspects of dying or decision-making. Psychological support is necessary to provide quality of end-of-life care, and NH caring staff may be called upon to get more involved in it as compared to GH staff. Also, GH staff find it difficult to communicate verbally with residents due to the prevalence of cerebrovascular diseases, as mentioned above. Also, because the availability of medical treatment is limited at long-term care facilities and because elderly people entering these facilities are frail or independent, discussing end-of-life care strategies such as artificial nutrition or resuscitation between staff, residents and families at the time of admission is essential. Physicians generally play an important role in such discussions, especially at NHs, but, when physicians are not on hand, nursing or caring staff may be involved in decision-making concerning end-of-life care. This may explain why many NH staff showed an interest in communication skills or decision-making on end-of-life care.

NH staff expressed a stronger desire to learn about physical care and symptom management than GH staff. Physicians or nurses are generally responsible for physical care and distress symptom management, which are central to quality of end-of-life care, but the number of physicians or nurses is limited at NHs. Therefore, NH staff have a greater need to acquire basic knowledge and information about physical pain in order to provide palliative care or to team-up with physicians than GH staff. Nurses and caring staff indicated different educational needs. Namely, caring staff expressed the desire to learn about physical care while the nurses' focus was on pain/symptom management. This is because caring staff are generally involved in supporting residents' daily living activities including transfer or feeding, and because pain/symptom management is generally a specialized field of nursing.

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# Goal-Setting Method and Goal Attainment Measures in Physical Therapy for Stroke Patients: a Systematic Review

YUMIKO KAMIOKA, RPT, MSc<sup>1)</sup>, TAKAKO YOSHINO, RPT, MSc<sup>2)</sup>, KIMIKO SUGAYA, RPT<sup>3)</sup>, HIDEYUKI SAITO, RPT, PhD<sup>4)</sup>, YUKARI OHASHI, RPT, PhD<sup>1)</sup>, SETSU IJIMA, MD, PhD<sup>5)</sup>

<sup>1)</sup>*Department of Physical Therapy, School of Health Sciences, Ibaraki Prefectural University of Health Sciences: 4669-2 Ami-Machi, Inashiki-Gun, Ibaraki 300-0394, Japan.  
TEL +81 29-840-2871, E-mail: ykamioka@ipu.ac.jp*

<sup>2)</sup>*Home-visit Nursing Station Pallium*

<sup>3)</sup>*Department of Physical Therapy, Ibaraki Prefectural University of Health Sciences Hospital*

<sup>4)</sup>*Department of Rehabilitation, Tsukuba Memorial Hospital*

<sup>5)</sup>*Comprehensive Human Sciences, University of Tsukuba*

**Abstract.** [Purpose] This review aimed: (1) to obtain all the facts regarding existing goal-setting methods in physical therapy; (2) to clarify the application status of the methods for stroke patients; and (3) to put forth a suggestion for the development of a format prepared by collaboration between stroke patients and physical therapists. [Methods] A systematic search was performed to identify the existing goal-setting methods and to obtain the relevant literature. We reviewed a total of 165 reports. [Results] We identified 8 types of goal-setting methods: Goal Attainment Scaling (GAS), the Canadian Occupational Performance Measure (COPM), goal forum intervention, and others. GAS was evaluated for its validity, reliability, and sensitivity for physically disabled children and the elderly, but there were no reports on the applicability of GAS to stroke patients. The COPM, which is a subjective measurement method using self-reporting, was evaluated for validity, reliability, and sensitivity for occupational therapy patients and physically disabled children. The goal forum intervention is a goal-setting method involving the collaboration of patients and physical therapists with the use of a check-list, but this method was developed for rheumatoid arthritis patients. [Conclusion] We recommend further studies on the development of a goal-setting method using a checklist for stroke patients and the evaluation of the validity and reliability of GAS for stroke patients.

**Key words:** Goal-setting, Goal attainment, Stroke

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## INTRODUCTION

One of the 10 key points described in the Management of Adult Stroke Rehabilitation Care<sup>1)</sup>, which is recommended by the Stroke Council of the American Heart Association, is that “evidence-based interventions should be based on functional goals”. The functions described in it include activities of daily living (ADL), instrumental

activities of daily living (IADL: shopping, meal preparation, use of the phone, driving a car, money management, and others), carrying heavy objects, and heavy household tasks. Furthermore, according to the National Clinical Guidelines for Stroke (2nd edition, UK)<sup>2)</sup>, one of the 4 core principles of rehabilitation approaches is that “all members of the healthcare team should work together with the patient, carer, and family, on the basis of a shared

philosophy and common goals”, and one of the recommendations regarding goal setting is that “goal setting should involve the patient and the family, if appropriate”.

Thus, an attempt to achieve goals jointly set by patients and therapists forms the heart of the whole stroke rehabilitation care process, and effective functional goals must be set as a precondition of intervention. Such goal-setting definitely requires patient involvement as well as the collaboration of patients and therapists. In addition, both parties should aim to achieve their goals with common recognition. This article considers these functions as productive activities and leisure activities in addition to ADLs and IADLs.

In a study on goal-setting in physical therapy, Payton et al.<sup>3)</sup> reported that only a few patients recognized that their involvement in goal-setting was effective and that most patients showed very little interest in participating in the goal-setting process. Wottrict et al.<sup>4)</sup> reported that stroke patients expected to be taken care of in hospitals and tended to believe that they had to obey the orders given by physical therapists. On the basis of the results of a tape recording and a questionnaire survey at first evaluation, Baker et al.<sup>5)</sup> clarified that physical therapists were aware that they should involve patients in goal-setting, but their efforts to ensure active involvement of their patients were inadequate. In particular, they did not inquire about their patients' priorities or explain that patients should work with therapists to set goals. In Japan, stroke patients in the chronic phase after being discharged tended to set improvement of impairments as their goal, while physical therapists regarded the maintenance of impairments or enhancement of functioning as goals, which suggests that the goals were not being mutually determined<sup>6,7)</sup>.

These studies suggest that the setting of functional goals by patient involvement and the attempt by patients and physical therapists to achieve their goals with common recognition have not been sufficient in terms of current physical therapy practice for stroke patients. The reason may be that patients are not aware of the importance of their own involvement in goal-setting or that therapists' efforts to encourage their patients to participate in goal-setting are insufficient. Each patient has different functions that he/she wishes to improve (or to be improved). For this reason, their

involvement is essential in order for them to set meaningful functional goals that address their concerns and/or priorities. Among patients, those who have been discharged from hospital are particularly required to participate in goal-setting. Therefore, a tool that encourages patients to participate in goal-setting—in other words, a special format that enables the patients and physical therapists to jointly participate in goal-setting—could be effective in setting meaningful functional goals for each patient.

What should we do to encourage patients and physical therapists to achieve goals with common recognition? In general, assessment of the functional status of stroke patients, including the Functional Independence Measure (FIM), is used to evaluate outcome measures of physical therapy. Apart from these conventional measures, outcome measures of individual goal attainment level, which are goal attainment measures, could be useful when jointly evaluated by patients and physical therapists. Periodic evaluation of the goal attainment level would allow the patients and physical therapists to maintain common recognition regarding their goals, and also facilitate the achievement of their goals. Physical therapists would show their willingness to perform more effective intervention in order to achieve the functional goals by using an evaluation of goal attainment, and the patients would be encouraged to attempt to achieve their own functional goals in their daily lives.

In order to seek methods of goal-setting and evaluation of the goal attainments suitable for stroke patients, the full facts concerning the existing goal-setting methods should be understood and the adaptation of existing methods to stroke patients should be discussed. In some reviews, outcome measures based on the goal of each patient<sup>8-15)</sup> have been evaluated, but goal-setting methods have not been the focus of any review.

This review aimed: (1) to obtain all the facts about existing goal-setting methods in physical therapy; (2) to clarify the application of the method to stroke patients and (3) to put forth a suggestion for the development of a format that is prepared by collaboration between stroke patients and physical therapists. Furthermore, goal attainment measures were included in this review because a series of processes contained both goal-setting methods and goal-attainment measures.

## SUBJECTS AND METHODS

### *Subjects*

EBSCOhost MEDLINE (1965 to December 2007) and CINAHL (1982 to December 2007) were used. All the data used were obtained from journal articles written in English.

The purpose of the first step was to search the relevant literature to identify existing goal-setting methods in physical therapy. The search terms used were 1) "goal setting methods < and > physical therapy", 2) "goal setting < and > physical therapy", 3) "goal attainment < and > physical therapy", 4) "patient involvement < and > physical therapy", 5) "patient centered < and > physical therapy", and 6) "communication skill < and > physical therapy". The relevant number of hits was calculated by subtracting the number of overlapping hits from the total number of hits for 1) ~ 6). The number of overlapping hits was confirmed by the titles. The phrases "patient involvement", "patient centered", and "communication skill" were added because articles whose research themes were patient involvement in goal-setting, goal-setting focused on patients and the communication skill of therapists in goal-setting were also included.

The purpose of the second step was to search the relevant literatures to identify existing goal-setting methods for stroke rehabilitation care. The search terms used were 7) "goal setting methods < and > rehabilitation < and > stroke", 8) "goal setting < and > rehabilitation < and > stroke", 9) "goal attainment < and > rehabilitation < and > stroke", 10) "patient involvement < and > rehabilitation < and > stroke", 11) "patient centered < and > rehabilitation < and > stroke", 12) "communication skill < and > rehabilitation < and > stroke", 13) "goal setting methods < and > rehabilitation < and > cerebral vascular accident", 14) "goal setting < and > rehabilitation < and > cerebral vascular accident", 15) "goal attainment < and > rehabilitation < and > cerebral vascular accident", 16) "patient involvement < and > rehabilitation < and > cerebral vascular accident", 17) "patient centered < and > rehabilitation < and > cerebral vascular accident", and 18) "communication skill < and > rehabilitation < and > cerebral vascular accident". The relevant number of hits was calculated by subtracting the number of overlapping hits from the total number of hits for 7) ~ 18). The number of overlapping hits was confirmed by the titles.

The purpose of the third step was to obtain articles containing goal-setting methods as the main theme by selecting from articles that were retrieved in step 1 and step 2, and to identify the existing goal-setting methods according to descriptions in the articles obtained. Articles containing the goal-setting method as the main theme in their titles and abstracts were selected from the articles that were retrieved in step 1 and step 2. The obtained articles were studied, and existing goal-setting methods in physical therapy were identified.

The purpose of the fourth step was to obtain literature that evaluated the validity, reliability, sensitivity, and clinical usefulness of the goal-setting methods by conducting further searches of the obtained existing goal-setting methods. A search was performed using the names of the goal-setting methods and rehabilitation, outcome measure, stroke, and cerebral vascular accident.

The first three steps aimed to identify all the existing goal-setting methods in physical therapy. Therefore, articles on all diseases, generations, and various environments (acute phase, outpatients, rehabilitation centers, home visits, etc.) were collected. In terms of the type of article, original articles, case reports, research reports, reports, systematic reviews, reviews, and issues were included in this study. Articles that were not written in English, articles without abstracts, case reports where the main theme was not the goal-setting method, and articles where the main themes were interventions for patients dysfunctions and ADL and their outcomes were excluded. The goal-setting methods were identified on the basis of the methods used in the retrieved literature or descriptions of the articles. The methods were selected if they contained some goal-setting processes. Methods that were developed for other fields such as occupational therapy and nursing care but were also used in physical therapy were included. Furthermore, methods that were developed for use by rehabilitation teams but had processes used in physical therapy were also included. Methods that were developed for other fields and not used in physical therapy and methods that were developed for use by rehabilitation teams and had no processes used in physical therapy were excluded.

In the fourth step, reports, systematic reviews, and critical reviews that evaluated the validity, reliability, and sensitivity of the identified goal-setting methods were included. Literature that used

goal-setting methods and discussed the clinical usefulness of the methods were included. However, articles that did not evaluate the validity, reliability, and sensitivity of the goal-setting methods were excluded. Literature that used goal-setting methods but did not discuss the clinical usefulness of the methods were also excluded.

### Methods

Data were also extracted on the basis of the references of the obtained articles. Data regarding the selected goal-setting methods were extracted on the basis of characteristics such as the purpose<sup>16)</sup>, format of administration<sup>8)</sup>, process of goal-setting, goal attainment assessment, and groups tested with measures<sup>16)</sup>, according to Finch et al.<sup>16)</sup> and Sakzewski et al.<sup>8)</sup>.

The most common types of validity reported are content, criterion, and construct validities<sup>16)</sup>.

Content validity concerns the extent to which items in a measure represent adequate sampling of the content<sup>16)</sup>. In this review, data were extracted by focusing on the suitability of items used in the methods, the appropriateness of the goal set by the methods, and the fulfillment of the criterion that representatives (e.g., parents) answered the question instead of young children.

Criterion validity concerns the extent to which a measure is related to a "gold standard" or other external measures in the same domain. The two main types of this validity—concurrent and predictive—differ from the perspective of time<sup>16)</sup>. The predictive validity was not evaluated in the case of studies on the criterion validity of the goal-setting methods because the goal-setting method was an individualized outcome measure. Accordingly, data concerning concurrent criterion validity were extracted. Concurrent criterion validity was the degree of the correlation between other external measures and the goal-setting methods (Pearson's product-moment correlation coefficient,  $r$  or Spearman's rank correlation coefficient,  $r_s$ ). The correlation level was classified into low (correlation coefficient, 0.20–0.40), moderate (0.41–0.70), and strong ( $\geq 0.71$ ).

If no definite criteria are provided, construct validity should be considered. In order to demonstrate the construct validity, the measurement of characteristics should be theorized and the study result and the assumed theory should be consistent. The construct validity evaluates (1) the consistency

level with other scales that may measure the same character (convergent validity) and (2) the correlation level with other scales that may measure different characteristics (divergent or discriminant validity)<sup>16)</sup>. Therefore, related data were extracted.

Adoption of concurrent criterion validity or construct validity depends on whether the FIM and Barthel Index (BI) are considered gold standards, but data were extracted on the basis of descriptions by the authors.

Reliability is categorized into internal consistency reliability, inter-rater reliability, and test-retest reliability. Reliability coefficients such as Cronbach's coefficient alpha ( $\alpha$ ), intra-class correlation coefficient (ICC),  $r$ , and Cohen's kappa ( $k$ ) were extracted as data<sup>16)</sup>.

The significance of changes in measurement and results from the calculation of the effect size and relative efficiency were extracted as data for responsiveness.

A probability level of 0.05 was used to test for statistical significance.

## RESULTS

A total of 159 articles were extracted in step 1. From these, 63 articles were selected in step 3 on the basis of their titles and abstracts. From the 133 articles selected in step 2, 35 were selected in step 3 on the basis of their titles and abstracts. Thus, a total of 98 articles (I) were examined. Further, specific goal-setting methods were used in 30 articles<sup>12,17-45)</sup>; these methods were Goal Attainment Scaling (GAS), the Canadian Occupational Performance Measure (COPM), Treatment Evaluation by Le Roux's method (TELER), the Patient Goal Priority Questionnaire (PGPQ), the Patient Participation System, a 5-step process for writing functional goals, a goal forum intervention, and the goal-planning method at Rivermead Rehabilitation Centre (Table 1).

In step 4, the set of search terms included "goal attainment scaling", "canadian occupational performance measure", "TELER", "patient goal priority questionnaire", "patient participation system", "writing functional goals", "goal forum intervention", and "rivermead rehabilitation centre".

A total of 150 articles were found using the search term "goal attainment scaling". The number of articles was narrowed down to 72 with the use of

**Table 1.** Selected goal-setting method by search

Goal-setting method	Author of literature using goal-setting method
GAS	Steenbeek et al. <sup>12)</sup> , Palisano et al. <sup>17)</sup> , Palisano et al. <sup>18)</sup> , Easley <sup>19)</sup> Brown et al. <sup>20)</sup> , Reid et al. <sup>21)</sup> , King et al. <sup>22)</sup> , King et al. <sup>23)</sup> King et al. <sup>24)</sup> , Boccignine et al. <sup>25)</sup> , Paolicelli et al. <sup>26)</sup> Fisher et al. <sup>27)</sup> , Maenpaa et al. <sup>28)</sup> , Schreiber <sup>29)</sup> , Mulligan et al. <sup>30)</sup> Turner-Stokes et al. <sup>31)</sup> , Grenville et al. <sup>32)</sup> Cott et al. <sup>33)</sup> *, Holliday et al. <sup>34)</sup> **
COPM	Jansa et al. <sup>35)</sup> , Harris et al. <sup>36)</sup> , Wressle et al. <sup>37)</sup> , Mew et al. <sup>38)</sup> Cott et al. <sup>33)</sup> *, Holliday et al. <sup>34)</sup> **
TELER	Mawson <sup>39)</sup>
PGPQ	Asenlof et al. <sup>40)</sup> , Asenlof et al. <sup>41)</sup>
Patient Participation System	Nelson et al. <sup>42)</sup>
5-step process for writing functional goals	Randall et al. <sup>43)</sup>
goal forum intervention	Arnetz et al. <sup>44)</sup>
Goal-planning method at Rivermead Rehabilitation Centre	Wade <sup>45)</sup>

GAS: Goal Attainment Scaling, COPM: Canadian Occupational Performance Measure, TELER: Treatment Evaluation by A le Roux's method, PGPQ: The Patient Goal Priority Questionnaire, Cott et al.<sup>33)</sup>\* and Holliday et al.<sup>34)</sup>\*\* overlapped (GAS and COPM)

the following terms: "goal attainment scaling < and > rehabilitation", "goal attainment scaling < and > outcome measure", "goal attainment scaling < and > stroke", and "goal attainment scaling < and > cerebral vascular accident". Of these 72 articles, 23 articles (II) on the validity, reliability, responsiveness, and clinical utility of GAS were selected on the basis of their titles and abstracts.

Moreover, 133 articles were found with the search term "Canadian occupational performance measure". The number of articles was then narrowed down to 83 with search terms such as "Canadian occupational performance measure < and > rehabilitation", "Canadian occupational performance measure < and > outcome measure", "Canadian occupational performance measure < and > stroke", and "Canadian occupational performance measure < and > cerebral vascular accident". Of these 83 articles, 31 articles (III) on the validity, reliability, responsiveness, and clinical utility of the COPM were selected on the basis of their titles and abstracts.

Nine articles were found with the search term "TELER" and 1 article each was found for the terms "patient goal priority questionnaire", "patient

participation system", "writing functional goals", and "goal forum intervention" (IV). No articles were found with the term "rivermead rehabilitation centre".

The 165 abovementioned articles (I–IV) were obtained and studied (Fig. 1).

Table 2 shows the characteristics of the 8 types of goal-setting method selected. There were 4 types of formats of administration for the above-mentioned methods: a checklist, a structured interview, a semi-structured interview, and an interview. A method using the checklist was the goal forum intervention; a structured interview was used in a goal-planning method at the Rivermead Rehabilitation Centre; semi-structured interviews were used in three methods, namely, COPM, the Patient Participation System, and PGPQ; and interviews were used in three methods, namely, GAS, the TELER, and the 5-step process for writing functional goals.

There were 2 types of goal attainment measure: quantitative measurement and descriptive assessment. There were 4 quantitative measurement methods: GAS, COPM, the TELER, and PGPQ. GAS is an objective method used to evaluate the goal attainment level on a 5-point scale.



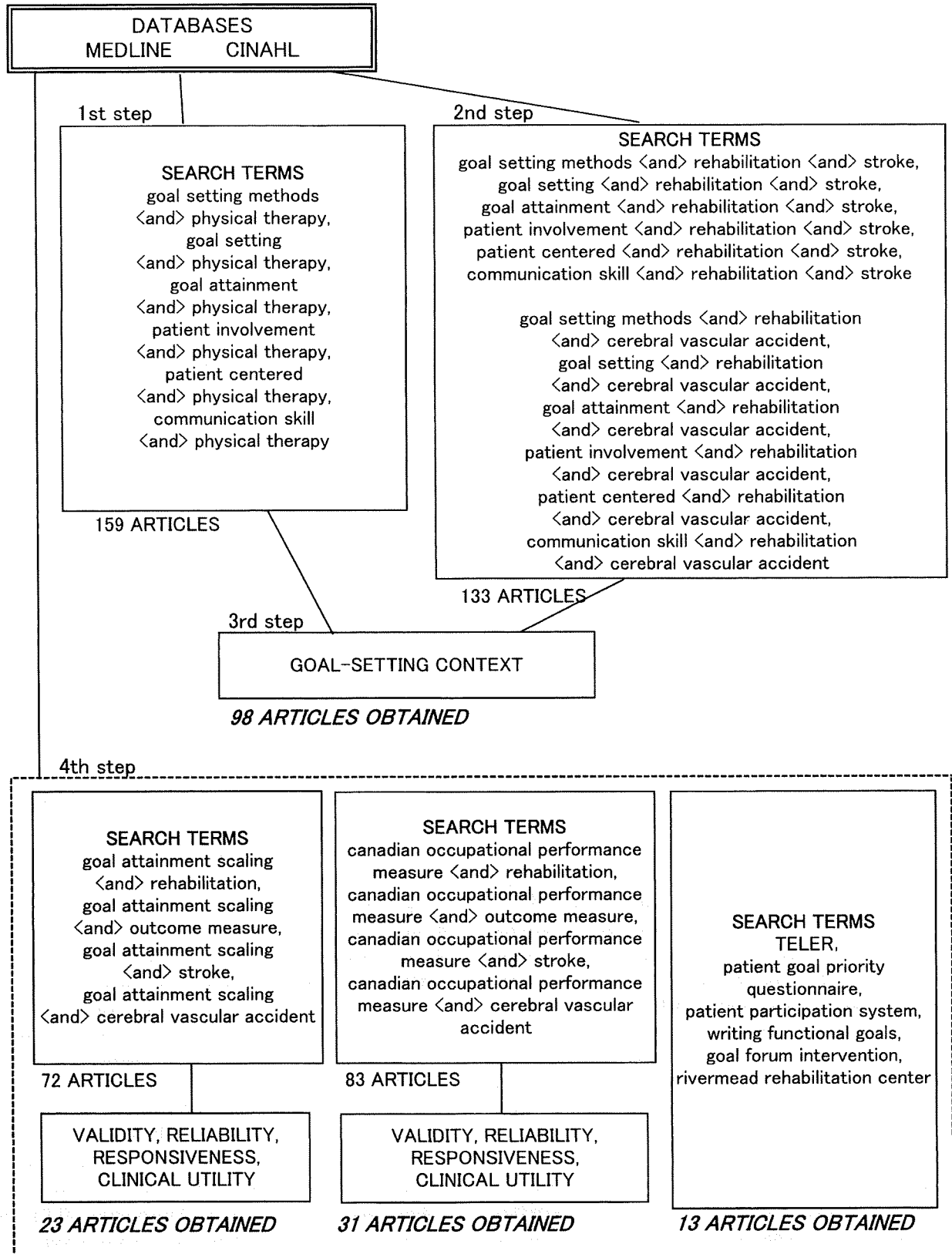


Fig. 1. The steps in the search strategy to obtain the articles.

The TELER is also an objective method used to evaluate the goal attainment level using codes on a 6-point scale. COPM and PGPQ are subjective methods whereby patients evaluate their goal attainment level by means of self-reports. The descriptive assessment methods were of 2 types: the Patient Participation System and the goal-planning method used at the Rivermead Rehabilitation Centre. The goal forum intervention and the 5-step process for writing functional goals had no goal attainment measures.

Each goal-setting method is summarized as follows.

GAS was developed by Kiresuk and Sherman to evaluate a regional mental health program and was published in 1968<sup>46</sup>. GAS uses outcome levels predicted by outcome measures based on each patient's goal. For each goal, 5 possible outcome levels are predicted on a 5-point scale (from -2 to +2), where -2 indicates "much less than the expected outcome level"; -1, "somewhat less than the expected outcome level"; 0, "expected level of outcome"; +1, "somewhat more than the expected outcome level"; and +2, "much more than the expected outcome level". GAS T-scores are then calculated by assigning weights to each goal<sup>46,47</sup>. According to Kiresuk<sup>46</sup>, the average outcome is represented by a T-score of 50, and the outcome is better than the predicted one when the T-score is greater than 50<sup>8</sup>. Patients were encouraged to participate in the goal-setting processes<sup>47</sup>, but no specific method was provided. Therefore, this may be considered to be an interview via free conversation, to set goals. The validity, reliability, and responsiveness of GAS has been evaluated not only in the mental health field but also in various fields such as those involving children with disabilities (e.g., cerebral palsy and mental and/or physical retardation), elderly patients, brain injury patients, dementia patients, and frail elderly people (Table 3, 4)<sup>8,11,17,18,48-61</sup>. In children with disabilities, no significant correlation was noted between the standardized measure, the Peabody Gross Motor Scale, and the GAS T-score<sup>17,18</sup>, which suggests that GAS determines aspects different from the Peabody Gross Motor Scale. In contrast, a moderate correlation was noted between the standardized measures, i.e., BI and FIM, and the GAS T-score in frail elderly people, which supports the construct validity of GAS. Good results were generally obtained with regard to the inter-rater

reliability, regardless of the presence or absence of diseases<sup>11,52,54,55,58-60</sup>. Reid et al.<sup>21</sup> reported that the clinical utility of this technique had been observed in stroke patients, but no reports that verified either its validity or reliability were available. However, Stolee et al.<sup>54,55</sup> demonstrated moderate to strong correlations between standardized measures (BI and OARS Index of Instrumental Activities of Daily Living) and the GAS T-score in elderly patients, including stroke patients ( $r = 0.86, 0.60$ ), which supports the construct validity. Furthermore, Joyce et al.<sup>52</sup> demonstrated a strong correlation between the global clinical impression and GAS T-score in brain injury patients ( $r = 0.81$ ), which confirms the convergent validity and higher inter-rater reliability<sup>52</sup>. Malec et al.<sup>53</sup> published (1) the monitoring of patient progress, (2) the structuring of team conferences, and (3) ongoing rehabilitation planning and decision-making as useful parameters in the rehabilitation of brain injury patients.

COPM was developed by a group of occupational therapists in Canada, who were mainly engaged in law, in order to evaluate the outcomes in the fields of self-care, productivity, and leisure; it was published in 1990<sup>62</sup>. Patients' target performance and satisfaction of activities were measured on a 10-point scale (1-10) based on self-reports. Each COPM performance score and COPM satisfaction score is provided by dividing the total scores of some goals by the number of goals. COPM is a goal-setting method for setting performance goals in the fields of self-care, productivity, and leisure as well as for measuring the outcome. Goals are set using a semi-structured interview<sup>16,62</sup>. The validity, reliability, responsiveness, and clinical utility of both goal-setting and outcome measures in COPM have been evaluated for various types of patients such as individuals undergoing occupational therapy (the elderly, persons who receive mental health care, and disabled persons), children with disabilities, stroke patients, patients with rheumatoid arthritis, and patients with spinal cord injuries (Table 5, 6)<sup>63-79</sup>. The validity of goal-setting for individuals who underwent occupational therapy and for children with disabilities was demonstrated because the activities targeted by the COPM were consistent with those acknowledged as problems in other indexes or in a free-response questionnaire method<sup>64,65,73</sup>. Furthermore, the inter-rater reliability<sup>67,73</sup> and the test-retest

**Table 2.** Characteristics of selected goal-setting methods

Method (Developers)	Purpose	Format of administration	Process of goal setting	Goal attainment assessment	Groups tested with measures
GAS(Kiresu k et al. <sup>46</sup> )	To evaluate comprehensive community mental health programs <sup>46</sup>	Interview	The goals are set by a therapist or in collaboration with the client. The therapists write titles for goals areas and individual goals expressed on a 5-point scale <sup>8,47</sup> .	5-point scale (-2 - +2) 0=expected level of outcome +2=much more than the expected outcome level -2=much less than the expected outcome level Each goal weighted, and T-score calculated <sup>8,46,47</sup> .	Clients/patients of mental health programs <sup>11,48</sup> , young children with disabilities <sup>8,17,18,49,50</sup> , stroke or brain injuries <sup>1,31-33</sup> , geriatric care <sup>4,5,51</sup> , Alzheimer's disease or dementia <sup>5,6,37</sup> , cognitive rehabilitation <sup>38</sup> , frail elderly <sup>39</sup> , and other <sup>60,61</sup>
COPM (Law et al. <sup>62</sup> )	To assess client outcome in areas of self-care, productivity and leisure and to establish performance goals based on the client's perception <sup>6,62</sup>	Semi-structured interview	The occupational therapists identify performance goals based on the client's perceptions of need in the areas of self-care, productivity, and leisure (Step 1). The client is asked to rate the importance to him of these activities (Step 2). Based on Step 2, the five most urgent problems are identified. The client rates the baseline (Step 3) <sup>6,62</sup> .	Self-reports (10-point) of performance and satisfaction for identified performance goals (self-care, productivity, and leisure) (Step 4) <sup>6,62</sup>	Clients/patients of OT services <sup>63-69</sup> , schizophrenia <sup>70,71</sup> , young children with disabilities <sup>72,73</sup> , stroke <sup>74</sup> , and other <sup>75-79</sup>
TELER (Le Roux <sup>80</sup> )	To assess the effectiveness of physiotherapy for children with spastic CP <sup>80</sup>	Interview	A treatment aim or goal is negotiated with the patient. A treatment aim or goal is a title of TELER indicator. The codes (coded 0-5) are defined to show progress during treatment <sup>80</sup> .	Code 0-5 Code 0: describes the deficit to be resolved Code 5: shows that the deficit has been resolved <sup>80,81</sup>	Acute stroke patients <sup>82</sup>
PGPQ (Asenlof et al. <sup>40</sup> )	To identify musculoskeletal pain patients' behavioral goals <sup>40</sup>	Semi-structured interview	The patients list behavioral goals and measure self-reports of current behavioral performance, satisfaction, and expectation on 11-point scales <sup>40</sup> .	Self-reports (11-point) of current behavioral performance, satisfaction, expectation <sup>40</sup>	Patients with persistent musculoskeletal pain <sup>40,87</sup>
Goal forum intervention (Arnetz et al. <sup>44</sup> )	To establish goals for physical therapy treatment by therapist and rheumatoid arthritis patient together <sup>44</sup>	Checklists	After the first session, the patient is asked about his goals for pain, for physical ability and for functional ability. The therapists summarize the patient's goals for the same categories. In a second session, the therapist and patient compare their respective checklists and agree upon treatment goals <sup>44</sup> .	None	None
Patient Participation System (Payton et al. <sup>88</sup> )	To conduct interviews with a patient in setting their own treatment goals <sup>2,2</sup>	Semi-structured interview	Four questions are the basis: What are your concerns? What are your goals? What have you achieved? What worked? For each question, the therapist involves the patient in the processes of exploration, selection, and specification <sup>42,88</sup> .	Description	None
5-step process for writing functional goals (Randall et al. <sup>43</sup> )	To collaborate with patients and therapists to identify functional goals <sup>43</sup>	Interview	Writing functional goals is recommended that contain the following elements: who (=patient), will do what, under what conditions, how well, by when <sup>43</sup> .	None	None
Goal-planning method at RRC (Wade <sup>45</sup> )	To obtain the patient's wishes and use by multidisciplinary team <sup>45</sup>	Structured interview	A semi-structured interview is used to obtain the patient's wishes and expectation. The goals are set at a multiprofessional meeting <sup>45</sup> .	Description	None

GAS: Goal Attainment Scaling, COPM: Canadian Occupational Performance Measure, OT: occupational therapy, TELER system: Treatment Evaluation by A le Roux's method, CP: cerebral palsy, PGPQ: Patient Priority Questionnaire, COPD: Chronic Obstructive Pulmonary Disease, RRC: Rivermead Rehabilitation Centre

Table 3. Evidence for validity of Goal Attainment Scaling (GAS)

Population (Clients or Patients)	Content validity	Criterion validity (Concurrent)	Construct validity (Convergent, Divergent, Discriminant)
Mental health programs	Goal appropriateness in terms of reasonability or realism as assessed by therapists or other was quite high ( from a critical review <sup>(1)</sup> )	12 studies correlate GAS T-score or change score with consumer satisfaction. Significance low to moderate correlations ( $r=0.24 \sim 0.63$ ) – non significant correlations ( from a critical review 8,11,48)	NS
Children with disabilities	77 ~ 88% of the therapists' rating for three dimensions supported content validity <sup>(Note)(18)</sup>	Non significant correlations between PGMS and GAS change score ( $r=0.25, 0.33$ ) <sup>(17,18)</sup>	No correlation between COPM and GAS <sup>(49)</sup>
Brain injuries	Content analysis of goal areas (GAS goals were set in 17 of 18 goal areas in the rehabilitation of brain injury patients) supported content validity <sup>(52)</sup>	NS	Strong correlation between CGI and GAS change score ( $r=0.81$ ) <sup>(52)</sup>
Geriatric (include stroke)	The agreement (82%) in identifying goal areas by two geriatricians, and content analysis of goal areas (GAS goals were set in 12 of 13 goal areas in the geriatric rehabilitation) supported content validity <sup>(54)</sup> . Content analysis of goal areas supported content validity (GAS goals were grouped into major categories, of which the most common were mobility, future care, ADL/IADL, bowel and bladder problems) <sup>(55)</sup>	Strong correlation between BI and GAS change score ( $r=0.86$ ) <sup>(54)</sup>	Moderate correlation between BI, OARS-IADL and GAS change score ( $r=0.60, 0.48$ ) <sup>(55)</sup>
Alzheimer's disease or dementia	NS	Strong correlation between CGI ( $r=0.85$ ), moderate correlation between ADAS-Cog ( $r=0.52$ ), GDS ( $r=0.63$ ) and GAS change score <sup>(56)</sup>	Poor correlation between BI, HABAM, CIRS and GAS change score ( $r_s=-0.22 \sim 0.17$ ) <sup>(57)</sup>
Cognitive rehabilitation	NS	NS	Moderate correlation between MEDLS ( $r=0.52$ ), RDRS ( $r=-0.47$ ) and GAS change score <sup>(58)</sup>
Frail elderly	NS	NS	Moderate correlation between BI ( $r=0.59$ ), FIM ( $r=0.45$ ), the Physical Self-Maintenance Scale ( $r=-0.54$ ) and GAS change score <sup>(59)</sup>
Stroke	NS	NS	NS
Other	NS	Pain: Moderate to low correlation between walking (in 5 min) ( $r=0.47$ ), ODQ ( $r=0.31$ ) and GAS change score <sup>(61)</sup>	Lower-extremity amputations: Non-significant correlations between BI, LCI, and GAS change score <sup>(60)</sup>

NS: not specified, PGMS, Peabody Gross Motor Scales, COPM: Canadian Occupational Performance Measure, BI: Barthel Index, OARS-IADL: OARS-Index of Instrumental Activities of Daily Living, ADL/IADL: Activities of Daily Living / Instrumental Activities of Daily Living, CGI: 7-point clinical global impression, ADAS-Cog: Alzheimer's Disease Assessment Scale-Cognitive Section, GDS: Global Deterioration Scale, HABAM: hierarchical assessment of balance and mobility, CIRS: cumulative illness rating scale, MEDLS: Milwaukee Evaluation of Daily Living, RDRS: Rappaport Disability Rating Scale, FIM: Functional Independence Measure, LCI: Locomotor Capabilities Index, ODQ: Oswestry Low Back Pain Disability Questionnaire

r: Pearson's product-moment correlation coefficient

$r_s$ : Spearman's rank correlation coefficient

Note: Content validity was examined by having 10 physical therapists rate (5-point scale) 10 randomly selected GAS-formatted goals on three dimensions: (1) the importance of the goal for motor development and function, (2) whether the expected progress was achievable, and (3) whether each of the four levels of change was clinically important.

**Table 4.** Evidence for reliability, and responsiveness of Goal Attainment Scaling (GAS)

Population (Clients/Patients with)	Reliability			Responsiveness
	Internal consistency	Inter-rater	Test-retest	
Mental health programs	NS	7 studies: $r=0.52-0.95^{11)}$	$r=0.45^{11)}$	NS
Children with disabilities	NS	NS	NS	Supported (to detect change at 3 months <sup>18)</sup> , and 6 months <sup>17)</sup> ) Likert scale GAS was more sensitive than the traditional weighted GAS or COPM <sup>49)</sup>
Brain injuries	NS	$r=0.92, 0.94^{52)}$	NS	More responsive than BI <sup>51)</sup>
Geriatric (include stroke)	NS	ICC=0.93 <sup>55)</sup> ICC=0.87, 0.88 <sup>54)</sup>	NS	More responsive than BI, OARS-IADL, MMSE, NHP, a self-rated health question (by effect size and relative efficiency) <sup>55)</sup>
Alzheimer's disease or dementia	NS	NS	NS	More responsive than BI, HABAM, CIRS, Axis 8 of the BCBR (by effect size) <sup>57)</sup>
Cognitive rehabilitation	NS	ICC=0.95 <sup>58)</sup>	NS	More responsive than MEDLS, RDRS, and any other measure (by effect size and relative efficiency) <sup>58)</sup>
Frail elderly	NS	ICC=0.91 <sup>59)</sup>	NS	More responsive than FIM, BI, MMSE, and any other measure (by effect size and relative efficiency) <sup>59)</sup>
Stroke	NS	NS	NS	NS
Other	NS	<u>Lower-extremity amputations:</u> ICC=0.67 <sup>60)</sup>	NS	<u>Lower-extremity amputations:</u> More responsive than BI and LCI (by effect size and relative efficiency) <sup>60)</sup>

NS: not specified, COPM: Canadian Occupational Performance Measure, BI: Barthel Index, OARS-IADL: OARS-Index of Instrumental Activities of Daily Living, MMSE: Standardized Folstein Mini-Mental State Examination, NHP: Nottingham Health Profile, HABAM: hierarchical assessment of balance and mobility, CIRS: cumulative illness rating scale, Axis 8 of the BCBR: Axis 8 of brief cognitive rating scale, MEDLS: Milwaukee Evaluation of Daily Living Skills, RDRS: Rappaport Disability Rating Scale, FIM: Functional Independence Measure, LCI: Locomotor Capabilities Index  $r$ : Pearson's product-moment correlation coefficient  
ICC: intra-class correlation coefficient

reliability of the COPM scores were demonstrated<sup>67)</sup>, and the correlation between standardized measures (FIM motor) and the COPM scores was reportedly low<sup>63)</sup>. The test-retest reliability in stroke patients was reportedly high ( $r_s=.89, .88$ )<sup>74)</sup>, and none of the standardized measures (BI, Frenchay Activities Index, and Stroke-Adapted Sickness Impact Profile-30) significantly correlated with the COPM performance scores<sup>74)</sup>.

The TELER was developed by Le Roux to evaluate the effects of physical therapy in children with spastic cerebral palsy, and it was published in 1993<sup>80)</sup>. The measurement scale used in the TELER is the TELER indicators. The TELER indicators are mainly defined as the goal of movements for patients, and each goal attainment level is scored using 6 predefined codes (0 to 5)<sup>81)</sup>. This may be an interview method since it was specified that the goal was set with patients.

A method was applied in one article, in which the concurrent validity of the method was confirmed by investigating its relationship with the Motor Assessment Scale in patients with subacute stroke<sup>82)</sup>

(Table 7). Furthermore, it was only used as an outcome measure in case reports regarding nursing care for patients with fungating wounds<sup>83-85)</sup>.

PGPQ aims to determine behavior goals and evaluate the therapeutic effects for patients with musculoskeletal pain. It was developed and published in 2004 by Asenlof<sup>40)</sup>, and evaluates the target performance, satisfaction, and expectation of behavior using an 11-point scale (0-10) based on patients' self-reports. Initially, for goal-setting, "impossible" activities or activities that are difficult to carry out because of pain and activities that may be improved by appropriate treatment are listed. Next, 1-3 goals are determined and rated on the basis of their importance<sup>40)</sup>. The concurrent validity, test-retest reliability, and inter-rater reliability of the PGPQ were confirmed by Asenlof (Table 7), but use of the method has only been reported by Asenlof et al.<sup>40,41,86,87)</sup>.

The goal forum intervention was developed for patients with rheumatoid arthritis. Arnetz et al. developed this method to set goals for patients by collaboration between patients and physical therapists, and it was published in 2004<sup>44)</sup>. The goal

**Table 5.** Evidence for validity of Canadian Occupational Performance Measure (COPM)

Population(Clients or Patients)	Content validity	Criterion validity(Concurrent)	Construct validity(Convergent, Divergent, Discriminant)
Consumers of occupational therapy services	COPM was "good" at incorporating clients' considerations of their own occupational performance, however, "fair" in measuring the performance components of clients <sup>(Note) 63)</sup>	Low correlation between FIM-motor and COPM- performance score ( $r=0.32$ ) <sup>63)</sup> A majority of participants (53%), when asked about problems of daily living, spontaneously reported at least one of the problems raised on the COPM <sup>65)</sup>	Divergent validity was supported by the low correlation between the SIP68 and the COPM- performance score ( $r_s=-0.20$ ), COPM-satisfaction score ( $r_s=-0.19$ ) <sup>64)</sup> Convergent validity was supported by the fact that 63% of the corresponding problems in the DIP were reported to be a disruption of QOL and 74% of the corresponding problems in the SIP68 were identified as a disability <sup>64)</sup> Multivariate analyses showed that construct validity was supported <sup>65)</sup>
Young children with disabilities	Families ( as proxies ) completed the COPM without difficulty <sup>72)</sup>	71% problems reported in the replies to the open-end question matched the prioritized problems in the COPM <sup>73)</sup>	For 50% problems prioritized in the COPM there was a comparable item in the PEDI and for 39% problems there was a comparable item in the TAP(C)QOL <sup>73)</sup> . Internal consistency reliability results presented above indicate good construct validity as there were high correlations suggesting that items were cohesive <sup>72)</sup>
Stroke	NS	NS	Discriminant validity was supported by the non significant correlations between BI ( $r_s=-0.23$ ), FAI ( $r_s=-0.12$ ), SA-SIP30 ( $r_s=0.10$ ), Euroqol 5D ( $r_s=0.14$ ), Rankin Scale ( $r_s=0.21$ ) and COPM- performance score <sup>74)</sup>
Other	NS	<u>Spinal cord injury:</u> Moderate to low correlation between FIM-motor change score and COPM performance ( $r=0.35$ ) and COPM satisfaction change score ( $r=0.48$ ) <sup>76)</sup> <u>Pain:</u> Low correlation between tests of psychological functioning (BAI, BDI, ODS, PSEQ, PVAS) ( $r_s=0.3 \sim 0.4$ ) and COPM <sup>77)</sup>	<u>Rheumatoid arthritis:</u> Moderate correlation between HAQ component score ( $r=-0.52$ ), HAQ activity score ( $r=-0.67$ ) and COPM- performance score <sup>75)</sup>

Consumers of occupational therapy services: geriatrics, mental health, pediatrics and physical disabilities, NS: not specified, QOL: quality of life, SIP68: Sickness Impact Profile, FIM: Functional Independence Measure, DIP: Disability and Impact Profile, PEDI: Pediatric Evaluation of Disability Inventory, TAP(C)QOL: TNO AZL Preschool Quality of Life / Children's Quality of Life, BI: Barthel Index, FAI: Frenchay Activities Index, SA-SIP30: Stroke Adapted Sickness Impact Profile-30, HAQ: Health Assessment Questionnaire, BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory, ODS: Oswestry Disability Scale, PSEQ: Pain Self-Efficacy Questionnaire, PVAS: Pain Visual Analogue Scale.

r: Pearson's product-moment correlation coefficient  $r_s$ : Spearman's rank correlation coefficient

Note: The questionnaire was composed of 11 items, which were used to evaluate the degree of relevance and representativeness of the items/components of the COPM (a five-point ordinal scale).

forum intervention consists of goal checklists (patient goal checklist and physical therapist goal checklist) and a goal forum checklist for physical therapy. The intervention is a method in which patients and physical therapists discuss and compare each other's goal checklists by individually checking their goals. The checklists contain a total of 71 items on the following 3 fields of disability traits in rheumatoid patients: pain, body (range of motion, muscle strength, balance, and fitness), and functional ability (walking and ADL). Furthermore, the goal that they decide by discussion and the time plan are filled in the goal forum checklist for physical therapy. This method

does not contain goal attainment measures. Arnetz reported that improvement in the range of motion, muscle strength, and balance were better in a group that used the goal forum intervention than in a control group<sup>44)</sup>.

The Patient Participation System was first developed by Ozer (a neurologist) to enable patients to actively participate in setting their own treatment goal. Subsequently, his students, Payton (a physical therapist) and Nelson (an occupational therapist), modified the system so that it was suitable for both physical therapy and occupational therapy<sup>42)</sup>, and published it in 1990<sup>88)</sup>. The system consists of 4 questions: 2 questions at the first interview to set the

**Table 6.** Evidence for reliability and responsiveness of Canadian Occupational Performance Measure (COPM)

Population (Clients/ Patients with)	Reliability			Responsiveness
	Internal consistency	Inter-rater	Test-retest	
Consumers of occupational therapy services	NS	66% of the activities prioritized at the first assessment were also prioritized at the second assessment <sup>67)</sup>	ICC=0.67(performance) 0.69(satisfaction) <sup>67)</sup>	Client scores changed significantly upon reassessment <sup>66)</sup> Responsiveness was supported by 73% of the problems identified having a change in score of 2 points or more <sup>68)</sup> .
Young children with disabilities	$\alpha=0.73$ (performance), $\alpha=0.83$ (satisfaction) <sup>72)</sup>	80% problems agreement (2 occupational therapists) <sup>73)</sup>	NS	Change in clinical status was demonstrated by significant pre-post scores <sup>72)</sup> .
Stroke	NS	NS	$r_s=0.89$ (performance) 0.88(satisfaction) <sup>74)</sup>	NS
Other	NS	NS	<u>Schizophrenia:</u> ICC=0.84(performance) 0.85(satisfaction) <sup>71)</sup> <u>Ankylosing spondylitis:</u> ICC=0.92(performance) 0.93(satisfaction) <sup>78)</sup> <u>COPD:</u> ICC=0.92(performance) 0.90(satisfaction) <sup>79)</sup>	NS

Consumers of occupational therapy services: geriatrics, mental health, pediatrics and physical disabilities; NS: not specified, COPD: Chronic obstructive pulmonary disease ICC: intra-class correlation coefficient  $\alpha$ : Cronbach's coefficient alpha  $r_s$ : Spearman's rank correlation coefficient

**Table 7.** Evidence for validity, reliability of TELER and PGPQ

Method	Population (Clients/Patients with)	Validity		Construct (Convergent, Discriminant)	Reliability		Responsiveness
		Content	Criterion (Concurrent)		Inter-rater	Test-retest	
TELER	Stroke	NS	Strong to moderate correlations between MAS item and TELER indicator ( $r_s=0.51-0.99$ ) <sup>82)</sup>	NS	NS	NS	NS
PGPQ	Persistent musculoskeletal pain	NS	Moderate correlation between PDI total sum scores and PGPQ-performance ( $r=-0.40 \sim -0.45$ ) <sup>40)</sup> Strong correlation between PGPQ-performance and PGPQ-satisfaction ( $r=-0.77 \sim -0.83$ ) <sup>87)</sup>	NS	NS	NS	NS

TELER: Treatment Evaluation by A le Roux's method, PGPQ: Patient Goal Priority Questionnaire, NS: not specified, MAS: Motor Assessment Scale, PDI: Pain Disability Index r: Pearson's product-moment correlation coefficient  $r_s$ : Spearman's rank correlation coefficient

goal ("What are your concerns?" and "What are your goals?") and 2 after treatment ("What have you achieved?" and "What worked?"). It is characterized by a 4-level method for evaluating patient participation at the time of answering each question. The goal attainment measures are descriptive<sup>42,88</sup>.

A 5-step process for writing functional goals was proposed by Randall<sup>43</sup>) to set functional goals for patients by collaboration between patients and physical therapists. According to Randall's proposal, the 5 following factors should be noted down when goals are set: who (patient), will do what, under what conditions, how well, and by when. However, the process for goal-setting was not specifically stated; it may have been conducted by an interview. Moreover, the system does not contain goal attainment measures.

The goal-planning method at Rivermead Rehabilitation Centre is a method for hospitalized stroke patients; it inquires about the hopes and expectations of patients via a structured interview. It is also a goal-setting method that can be used in teams with various other occupations. Wade introduced the format of the technique described at Rivermead Rehabilitation Centre, Oxford, England, in 1999<sup>45</sup>). The goal attainment measures are descriptive.

No reports concerning stroke patients were available for PGPQ, the Patient Participation System, the 5-step process for writing functional goals, the goal forum intervention, and the goal-planning method at Rivermead Rehabilitation Centre. In addition, there have been no reports that have verified the validity of the Patient Participation System, the 5-step process for writing functional goals, or the goal-planning method used at the Rivermead Rehabilitation Centre as goal-setting methods.

## DISCUSSION

We obtained and reviewed a total of 165 articles on goal-setting methods.

According to the results of this review, 8 types of goal-setting methods were identified, which were controlled by 4 formats: a checklist, a structured interview, a semi-structured interview, and an interview.

Attending doctors should provide appropriate explanations to stroke patients during the

rehabilitation process to enable them to understand their disease, thereby obtaining their involvement in the goal-setting process. Physical therapists have a responsibility to encourage their patients to participate in the goal-setting process.

There are presently no guidelines to encourage stroke patients to participate in setting their goals, nor are there any goal-setting formats in current physical therapy for stroke patients; therefore, these are left to the discretion of the individual physical therapist. For this reason, the attempts of physical therapists to encourage patients to participate in setting their goals are not sufficient<sup>3-5</sup>), and effective patient involvement may not be expected. Cott<sup>89</sup>) proposed 6 criteria for effective goal achievement: goals that are challenging, achievable, specific, measurable, meaningful to the client, and that predict a time for evaluation. These 6 criteria are crucial for setting the goals of stroke patients and physical therapists based on discussions about the patients' concerns and the expertise of the physical therapists. The goal forum intervention<sup>44</sup>) is a method for obtaining patient involvement in goal-setting by using both goal checklists for patients and physical therapists. Using this method, the patients and physical therapists can discuss their goals, which have been described on the goal checklists. Thus, we consider that the goal forum intervention may be an effective method for setting goals. In addition, in the goal forum intervention, the goals are selected from items on goal checklists. Therefore, no special interview skill is required in order to gain an understanding of the concerns and/or priorities of patients. When patients' concerns are not listed in goal checklists, free space can be used. In such instances, patients can use items on goal checklists as a reference, to enable them to describe their concerns.

Goal-setting methods use checklists only for the goal forum intervention. However, the goal checklists of the goal forum intervention are designed for patients with rheumatism, and consequently they may not be applicable to stroke patients. Therefore, a goal-setting method specific to stroke patients should be established in the future based on the goal forum intervention, in order to encourage stroke patients to participate in their goal-setting and also to enable stroke patients and physical therapists to jointly set their goals. In order to advance this method, an assessment of physical therapy should be performed in order to facilitate



the joint setting of goals between patient and therapist. Thus, as a first task in developing a goal-setting method for stroke patients, a goal checklist to set functional goals for these patients should be devised.

The other 7 goal-setting methods using an interview (including a structured interview and a semi-structured interview) need physical therapists to acquire special interview skills to understand patients' concerns and/or priorities, which may become a limiting factor.

Goal attainment measures include quantitative measurement and descriptive assessment.

There are 4 types of quantitative measurement: GAS, COPM, the TELER, and PGPQ. GAS, which is an outcome measure used to assess individual goals, uses a 5-point scale (-2 to +2)<sup>46,47</sup>. GAS T-scores are then calculated by assigning weights to each goal. GAS evaluates the validity, reliability, and responsiveness as the goal attainment measures for patients with mental health disorders or brain damage, physically handicapped children, or the elderly<sup>11,48-61</sup>. Reid et al.<sup>21</sup> reported the clinical utility of GAS for stroke patients, but there have been no studies assessing its validity, reliability, and responsiveness. However, GAS has been used in the assessment of the validity, inter-rater reliability, and responsiveness for elderly patients, including stroke patients and patients with brain damage<sup>51-55</sup>. Consequently, it is likely to be applicable to stroke patients, which suggests that the validity, reliability, responsiveness, and clinical utility of GAS should be studied with stroke patients as subjects in the future.

COPM and PGPQ are subjective methods entailing self-reporting by patients. COPM evaluates the validity, reliability, and responsiveness in patients requiring occupational therapy (the elderly, patients with mental health disorders, and physically handicapped persons), physically disabled children, stroke patients, patients with rheumatism, and patients with spinal cord injury<sup>63-65,72-77</sup>. One research finding is that GAS and COPM are applicable to physically disabled children. The test-retest reliability of COPM is also suitable for patients with subacute stroke. Furthermore, there is no significant correlation between the standardized performance measures and COPM performance scores, thus, its discriminant validity is supported<sup>74</sup>. Consequently, COPM may be more useful for determining the

subjective goal attainment level in stroke patients. However, it has a limitation in terms of objectivity. PGPQ is applicable only to musculoskeletal pain patients<sup>40</sup>, and the method of self-reporting by patients lacks objectivity.

The TELER is a method used to evaluate the outcome using codes on a 6-point scale ranging from 0 to 5<sup>80,81</sup>. The TELER is an objective method; however, the codes are on an ordinal scale such that counting and analysis are limited.

The descriptive assessment has a limitation in terms of objective assessment and a graduated assessment of the progress necessary to achieve goals.

MEDLINE and CINAHL were used as literature search databases in this review. MEDLINE is the largest database of medical-related journals in the world and CINAHL lists more than 2,800 journals of nursing and health-related issues; hence, almost all the major journals were probably covered in this review. However, other databases, such as PEDro (Physiotherapy Evidence Database) and the Cochrane Library were not used, and this omission may be one of the limiting factors of this review.

This review draws the following 2 conclusions. First, the goal forum intervention is a tool that enables patients and physical therapists to jointly set their goals by using goal checklists for both patients and physical therapists. However, the goal forum intervention was chiefly developed for patients with rheumatoid arthritis and a goal-setting method specific to stroke patients should be developed based on the existing goal forum intervention. Second, GAS is an objective quantitative measurement method that verifies the validity and reliability of interventions for patients with various diseases (patients with brain damage and elderly patients) as goal attainment measures, and may also be applicable to stroke patients. Therefore, further study of the validity and reliability of GAS for stroke patients will be required.

The development of a goal-setting method and goal attainment measures applicable to stroke patients will be necessary in the future. Furthermore, the functional goals in physical therapy should reflect rehabilitation purposes, and it is expected that the sharing of goals and the cooperation and collaboration among the rehabilitation teams necessary to achieve these goals will be studied.

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