



Original Article

A content analysis of stroke physical therapy intervention using stroke physiotherapy intervention recording tool

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Abstract. [Purpose] Physical therapy for recovery of function in people with stroke is known to be effective, but which type of physical therapy intervention is most effective is uncertain because a concrete and detailed record of interventions is done. This study aimed to record, analyze, and describe the content of physical therapy interventions for recovery of function after stroke using stroke physiotherapy intervention recording tool (SPIRIT). [Subjects and Methods] A convenience sample of 23 physical therapists from a rehabilitation hospital in Chung-nam recorded the interventions for 73 patients with stroke who were treated for 30 minutes in 670 treatment sessions. Treatment session contents were recorded using SPIRIT. Descriptive statistics were used to describe the interventions accurately and to investigate the differences according to time since stroke. [Results] Facilitation techniques were the most frequently used interventions (n=1,342, 35.1%), followed by practice (n=1,056, 27.6%), and exercise (n=748, 19.6%) in the physical therapists' clinical practice. [Conclusion] This pattern shows that physical therapists were focused on functional activity. Organizing or teaching patient activities for independent practice interventions (n=286, 7.5%) were used to encourage patient activity and independence outside the treatment sessions. Interventions according to time since stroke were not significantly different.

Key words: Physiotherapy, SPIRIT, Stroke rehabilitation

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INTRODUCTION

The objective of rehabilitation for stroke patients is to restore normal function and improve quality of life¹⁾. While it is known that physiotherapy can be effective for rehabilitation of stroke patients, it is not clear what type of physiotherapy is most effective¹⁾. Physiotherapy is a technical interaction between therapists and patients for a specific purpose. It is process implemented and modified to achieve a mutually agreed objective. The process involves the application of physical, therapeutic-electrical, and motional methods. Additionally, aids are used for functional training, and counseling/training is provided to patients¹⁾. To restore function in stroke patients, effective physiotherapy interventions based on evidence are of utmost importance. While various forms of physiotherapy interventions are used, there is no system for recording them in a standardized format²⁾. Such lack of data is one of the critical factors that hinder evidence-based treatment³⁾. Accurate and concrete data on physiotherapy interventions are crucial to making evidence-based research possible. Stroke Physiotherapy Intervention Recording Tool (SPIRIT) was developed to address this problem. It is a recording system for physiotherapy interventions for stroke patients³⁾. SPIRIT can accurately record interventions such as balanced sitting, balanced standing, or walking, which are interventions used by physiotherapists to correct posture problems. This can assist physiotherapists in conducting effective interventions⁴⁾. Typical physiotherapy interventions used for stroke patients in Korea include bobath,

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neurodevelopmental treatment (NDT), and proprioceptive neuromuscular facilitation (PNF)^{5, 6}. The objective of the current study was to accurately record and analyze physiotherapy interventions for stroke patients using SPIRIT, and, thus, help patients choose effective interventions for functional recovery in clinical settings.

SUBJECTS AND METHODS

Participants who met the inclusion criteria and agreed to participate in the study received a general explanation of the study, and gave their written informed consent. All procedures were reviewed and approved by the Institutional Ethics Committee of Eulji University Hospital. A total of 23 physiotherapists and 73 stroke patients participated in the study. Physiotherapists received training on how to record SPIRIT 6 hours a day for a 3-day period. Only therapists with 5 years of clinical experience and central nervous system treatment certificates were selected. Therapists conducted physiotherapy interventions for 30 minutes a day 5 times a week for 1 week, and recorded them with SPIRIT. Characteristics of the therapists and patients who participated in the research are listed in Table 1. Data collected were recorded and statistically analyzed using SPSS 18.0. Frequency analysis was conducted to identify participants for research and methods of physiotherapy intervention.

RESULTS

A total of 3,824 interventions were recorded. Physiotherapy interventions used are indicated in Tables 2 and 3. The analysis of physiotherapy interventions for rehabilitation of stroke patients identifies the use of interventions such as facilita-

Table 1. General and medical characteristics of participants (N=73)

		Stroke patient
Gender (male/female)		36/37
Age (years)		65.2 ± 8.6 ^a
Height (cm)		165.8 ± 4.1
Weight (kg)		64.5 ± 5.4
Causes (infarction/hemorrhage)		40/33
Affected side (right /left)		34/39
Since onset (months)		2.2 ± 1.1
Modified Ashworth Scale (G0/G1/G1+)		20/43/10
Stages	Acute	1
	Rehabilitation	70
	Pre-discharge	2
Aims of treatment	Sitting balance	13
	Standing balance	12
	Walking	48

^amean ± SD

Table 2. Intervention frequencies (N=3,824)

Intervention	Total	Sitting balance	Standing balance
Facilitation	1,342 ^a (35.1 ^b)	200 (42.2)	192 (44.5)
Whole activities	870 (22.8)	224 (22.4)	252 (28.6)
Components of activities	472 (12.3)	94 (19.8)	79 (9.0)
Practice	1,056 (27.6)	24 (5.1)	109 (25.2)
Whole activities	794 (20.8)	14 (3.0)	151 (17.2)
Components of activities	262 (6.9)	10 (2.1)	80 (9.1)
Exercise	748 (19.6)	95 (20.0)	65 (15.0)
Organizing or teaching patient activities independent practice	286 (7.5)	30 (6.3)	20 (4.6)
Mobilization	193 (5.0)	68 (14.3)	10 (2.3)
Other activities	117 (3.1)	50 (10.5)	27 (6.3)
Provision of or training on the use of equipment	70 (1.8)	0 (0.0)	9 (2.1)
Teaching activities for support staff and/or health care professionals to perform/assist	12 (0.3)	7 (1.5)	0 (0.0)

^a N: number of persons, ^b %: percent

Table 3. Detailed intervention frequencies (N=3,824)

Intervention	Total (N ^a)
Facilitation	1,342
Whole activities	870
Walking with aids	178
Walking with help	127
Dynamic standing	94
Movement of the leg	71
Movement of the arm	66
Dynamic sitting	60
Free walking	55
Static sitting	53
Sit-to-stand	46
Outdoor mobility	39
Static standing	27
Bed mobility	17
Stairs	12
Transfers	5
Falls routine	0
Components of activities	472
Movement of the leg	136
Sit-to-stand	96
Walking	69
Movement of the arm	50
Standing	46
Sitting	30
Mobility	24
Transfer	10
Stairs	7
Falls routine	4
Practice	1,056
Whole activities	794
Walking with aids	182
Outdoor mobility	164
Free walking	162
Dynamic standing	67
Walking with help	42
Sit-to-stand	41
Dynamic sitting	29
Static standing	25
Treadmill	22
Stairs	21
Movement of the arm	19
Movement of the leg	13
Bed mobility	5
Falls routine	2
Static sitting	0
Transfer	0
Wheelchair skills	0
Components of activities	262
Walking	83
Sit-to-stand	42
Movement of the leg	38
Stairs	29

Intervention	Total (N ^a)
Movement of the arm	18
Bed mobility	17
Transfers	15
Wheelchair skills	12
Sitting	8
Standing	0
Falls routine	0
Exercise	748
Strengthening exercise	363
Stretching exercise	295
Resisted exercise	62
Cardiovascular fitness exercise	28
Organizing, or teaching, patient activities for independent practice	286
Sit-to-stand	87
Walking indoors	57
Stretching exercise	51
Strengthening exercise	39
Bed mobility	27
Outdoor mobility	10
Transfer	9
Cardiovascular exercise	6
Resisted exercise	0
Stairs	0
Mobilization	193
Shoulder girdle mobilization	79
Trunk mobilization	47
Specific joint mobilization	45
Specific muscle mobilization	22
Other activities	117
Gym ball	56
Postural perturbations	36
Sensory stimulation	25
Other	0
Providing equipment, or training the patient in the use of	70
Walking aids	48
Ankle foot orthosis	12
Other splints	5
Wheelchair skills	5
Transfer equipment	0
Teaching activities for support staff and/or hcp's to perform/assist	12
Positioning	7
Walking indoors	3
Outdoor mobility	2
Stretching exercise	0
Bed mobility	0
Transfers	0
Stairs	0
Wheelchair skills	0
Use of manual handling equipment	0
Use of ankle foot orthosis / splints	0

^aN: number of persons

tion (n=1,342, 35.1%), practice (n=1,056, 27.6%), exercise (n=748, 19.6%), the organizing or teaching of patient activities for independent practice (n=286, 7.5%), mobilization (n=193, 5.0%), other activities (n=117, 3.1%), training on the use of equipment (n=70, 1.8%), and teaching activities for support staff and/or healthcare professionals (HC) to perform/assist (n=12, 0.3%). The analysis of 90 sub-items of physiotherapy interventions indicates the use of the following physiotherapy interventions. In the 'facilitation' category, 'walking with aids' as a whole activity and 'movement of the leg' as a component of an activity were used. In the 'practice' category, 'walking with aids' as a whole activity and 'walking' as a component of an activity were used. In the 'exercise' category, 'strengthening exercise' and 'sit-to-stand' were used in the category of 'organizing of teaching patient activities for independent practice'. In the 'mobilization' category, shoulder girdle mobilization was used. In the 'other activities' category, gym ball was used. In the category of 'providing equipment or training patients in the use of equipment', 'walking aids', 'teaching activities for support staff and/or HCPs to perform/assist' were used. Furthermore, in the 'assist' category, the analysis found positioning was used.

DISCUSSION

It has been found that SPIRIT is helpful in recording and analyzing physiotherapy interventions for stroke patients. This analysis of physiotherapy intervention using SPIRIT shows that facilitation and practice are used frequently to assist functional recovery. Facilitation is intended to improve specific movements of the patients, and requires patients to move passively or actively with force applied by physical therapists. This includes whole activities as well as their individual components. 'Practice' requires patients to move actively under the supervision of the therapist. It also includes whole activities and their components. This exercise category includes stretching, muscle enhancement, resistance, and heart and lung exercise. The organizing of teaching patient activities or activities for independent practice are modes of training intended to enable the performance of special exercise or functional activities for patients with the supervision of healthcare experts. 'Mobilization' is a type of manual therapy that moves the spine, shoulder blades, pelvis, and joints in the body for the purpose of normalizing muscle tightness. Other activities include those that are not clearly specified such as gym ball exercise or sense stimulation. Provision of or training on the use of equipment indicates the application of below-knee orthosis, splints, and walking aids. The 'teaching activities for support staff and/or HCPs to perform/assist with' category includes teaching home exercise or precautions to help in the functional recovery of patients. The findings of the current study show that facilitation and practice constitute 62.7% of all physical therapy interventions. This indicates that activities and task-oriented approaches, which are the latest trends in physiotherapy intervention, are used. In particular, the findings reveal the use of the following physiotherapy interventions: 'walking with aids', 'walking with help', and 'dynamic standing' in whole activities, 'movement of the leg' and 'sit-to-stand' in components of activities, and 'walking with aids', 'outdoor mobility', and 'free walking' in whole activities. This result seems to be related to the fact that the goal of 48 out of the 73 patients (66%) was to walk. It also shows that the right interventions in achieving this goal were utilized. Previous study shows few instances of using strengthening or stretching exercises to normalize muscle tightness and improve the quality of movement⁷⁾. However, the current study has yielded results that are contrary to that of the previous study. Previous physiotherapy interventions did not focus on muscle strengthening exercise for the purpose of reducing abnormal muscle tightness⁸⁾. Currently, muscle strengthening exercises are used to prevent stiffness and contracture of joints, and alleviate muscle tightness. Teaching activities for support staff and/or HCPs to perform/assist with was performed minimally, recording a mere 0.3%. This shows that although it is an important exercise to help restore the independent function of patients, it is largely neglected. It is because most patients receive assistance in a group given the particular characteristics of hospital environments, rather than in a one-on-one setting. Limitations of the current study lie in the fact that physiotherapy interventions for stroke patients were recorded in a single rehabilitation hospital in Korea. Therefore, it is difficult to generalize the findings for all stroke patients.

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