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Case Report

Utilizing the self-training handouts creation system "Pattore !": a report of two cases

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ABSTRACT

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Objective: To report two cases of utilizing the self-training handouts creation system "Pattore !" ("Pattore !" hereinafter).

Methods: In two patients, handouts were created using "Pattore !" which is a system to compile self-training menus tailored individually for each patient on paper. The handouts were updated at appropriate timing, and the time required for creation was measured. Each patient made entries in the self-training record, and the therapist confirmed the implementation status. A questionnaire on patient satisfaction and self-efficacy was conducted before discharge from hospital. The same procedures were also conducted in a group of patients for whom the handouts were developed without utilizing "Pattore !".

Results: The average time required to prepare the handouts was shortened by using "Pattore !". Case 1 rated good patient satisfaction and self-efficacy, while Case 2 was not able to achieve high self-efficacy. The implementation rate was 100% for Case 1 and 85% for Case 2.

Conclusion: Effective use of "Pattore !" enhances the quality of self-training and contributes to implementation and continuation of training. Updating the handouts at appropriate timing and feedback that allows patient to perceive the exercise effect are expected to enhance patient satisfaction and self-efficacy.

Key words: self-training, handouts, patient satisfaction, self-efficacy, system

Introduction

In the rehabilitation setting, self-training guidance is performed on a daily basis. Since a therapist has limited time to work with one patient, self-training is important for the recovery of physical function. On the other hand, implementation and continuation of self-training is not easy, and how to encourage patients to engage in self-training is an issue.

Previous reports have shown that adoption of behavioral science-based theories and models is effective for exercise continuation, and that high self-efficacy promotes maintenance of exercise behavior [1–5]. Nakayama [6] classified human support for promoting physical activity of elderly persons into three categories: information provision, collaboration, and praise, and reported that guidance provided by experts was particularly effective. Kitawaki et al. [1] have reported the possibility that hospitalized elderly patients receiving direct guidance from therapists regarding the purpose and method of self-training achieve increase in self-efficacy, which may lead to continuation of exercise. These reports suggest that providing guidance using handouts of self-training tailored to individual patients compiled on paper (hereinafter, handouts), may be an effective method to enhance the implementation and continuation of self-training.

However, in our hospital, creation of such handouts consumed much time [7], with additional problems of delay in providing the handouts to patients and

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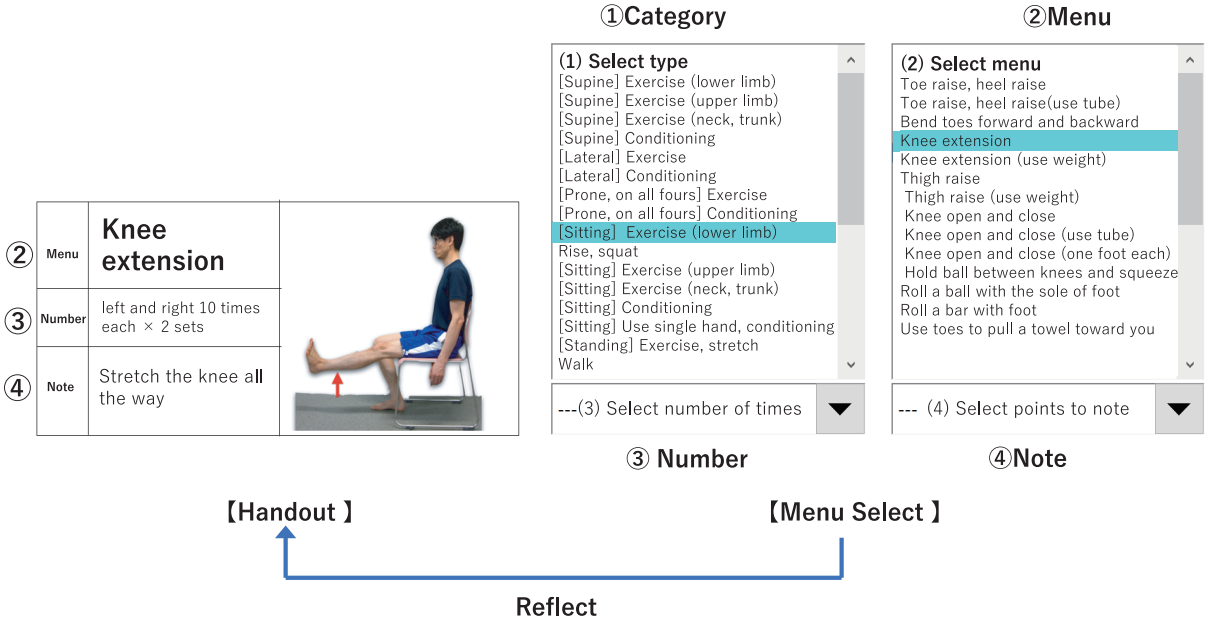


Figure 1. “Pattore !” Creation screen of handouts: Select 1→ 2 in order, then select 34 for 2.

inability to change the contents at appropriate timing. In order to prepare the handouts in a short time, we have developed a self-training handouts creation system using Microsoft Excel® (hereinafter, “Pattore !”). “Pattore !” has 190 types of menu images classified by posture and difficulty level. The feature of this system is that by simply selecting an item in the sheet, the content is reflected as written instructions that can be printed on paper [7] (Figure 1). In this article, we report two cases of utilizing “Pattore !” in the convalescent rehabilitation ward (hereinafter, convalescent ward).

Subjects

1. Case 1

A male patient aged in the 70s had left hemiplegia due to cardiogenic cerebral infarction. He was admitted to the convalescent ward on disease day 24. At admission, Stroke Impairment Assessment Set-motor (SIAS-m) scores were 2-3-3-4-3; Mini Mental State Examination (MMSE) score was 26; Functional Independence Measure (FIM) motor subscore was 57 and cognitive subscore was 32. Regarding ADL in the ward, wheelchair transfer and toileting were FIM score 5. In rehabilitation setting, he required minimum assistance with T-cane (without orthosis) walk. At discharge to home (disease day 52), FIM motor subscore was 73 and cognitive subscore was 33.

2. Case 2

A 70-year-old female sustained injury to the trochanter of her right femur due to a fall while walking with a cane, and underwent total hip replacement. Because of intraoperative occurrence of distal femur fracture, complete non-weight-bearing of the affected lower limb was prescribed. On postoperative day 55, one-third partial weight-bearing was started and she was admitted to the convalescent ward on the same day. At admission, manual muscle testing (MMT) of hip joint flexion on the affected side was grade 3 and MMT of hip joint extension was grade 2; numeric rating scale (NRS) of knee pain with weight bearing on the affected side was score 4; MMSE score was 29; FIM motor subscore was 63 and cognitive subscore was 35. Regarding ADL in the ward, wheelchair transfer was FIM score 6 and toileting was FIM score 4; gait training was not conducted. At discharge to home (postoperative day 121), FIM motor subscore was 75 and cognitive subscore was 35.

3. Group with handouts created without utilizing “Pattore !” (No “Pattore !” group)

This group consisted of nine patients admitted to the convalescent ward, with mean age of 70.2 ± 9.2 years and mean MMSE score of 26.8 ± 2.1. The diseases were cerebrovascular diseases in 4 patients, orthopedic diseases in 4 patients, and heart disease in 1 patient.

Methods

1. Creation of handouts

Using “Pattore !”, handouts were created for Case 1 and Case 2, and updated at the timing of change in degree of ADL independence or change in weight-bearing status. In the no “Pattore !” group, handoutss were created according to the conditions of individual patients by manually writing sentences and drawing figures or by combining multiple parts of menus in standardized sheets. The time required for preparing each handout was measured with a stopwatch.

2. Confirmation of implementation status of self-training

Each patient was instructed to make entry in a self-training record, and the implementation status was confirmed by the therapist. Based on the record, the rate of implementation from the start of self-training instruction to discharge was calculated.

3. Questionnaire survey

At discharge from hospital, therapists who were not in charge of training conducted interviews on a series of self-training. The items on the questionnaire were the Customer Satisfaction Scale based on Need Satisfaction [8, 9] and a scale on self-efficacy regarding implementation of training constructed with reference to previous studies [10−14]. As shown in Table 1, the questionnaire was divided into two categories: patient satisfaction with the handouts and self-efficacy, each consisted of three questions. Each question was rated on a 10-point scale, with 1 point for “not at all” and 10 points for “absolutely true”. The mean score of the three items in patient satisfaction and the mean score of the three items in self-efficacy were calculated.

Results

1. Time taken to create the handouts

The self-training handouts for Case 1 was created by a physiotherapist (11th year in service) for a total of four times, and the mean time required was 195 ± 26 (range: 152−221) seconds/ handout. The self-training handouts for Case 2 was created by a physiotherapist (2nd year in service) for a total of four times, and the mean time required was 245 ± 29 (195−270) seconds/ handout. For the no “Pattore !” group, handouts were created by physiotherapists who had 8.4 ± 6 years of experience, and the mean time required was 421 ± 158 (220−645) seconds/ handout (Table 2).

2. Case 1

According to the degree of ADL independence, four self-training handouts were given to the patient at the following timing: (1) wheelchair transfer FIM score 5 (disease day 24), (2) wheelchair transfer FIM score 6 (disease day 31), (3) T-cane walk in ward FIM score 6 (disease day 40), (4) T-cane walk in hospital FIM score 6 (disease day 47) (Figure 2).

In the first handout, considering the risk of falling, training was started with low-intensity menus that

Table 1. Items of questionnaire.

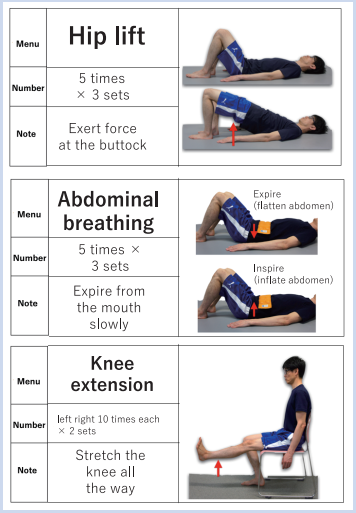
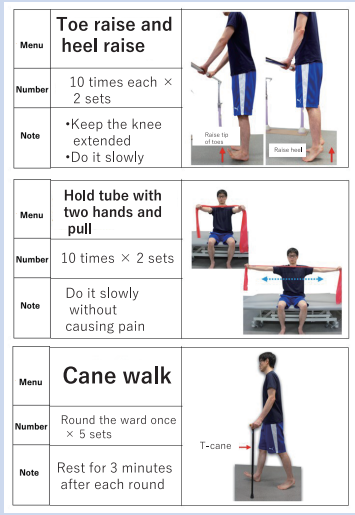
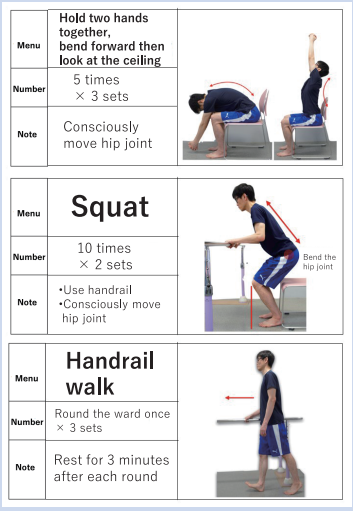
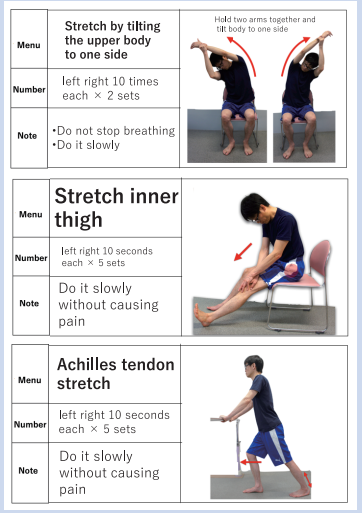
Questionnaire items
Patient satisfaction
1: Are the explanations and drawings in the handouts easy to understand ?
2: Do you feel that the handouts was custom-made for yourself ?
3: Did you receive a new handouts just when you felt you needed it ?
Self-efficacy
1: Do you feel that your body can move more smoothly by doing self-training ?
2: Do you feel that pain and discomfort are reduced by doing self-training ?
3: Do you think you can continue self-training after leaving hospital ?

Response is scored on a 10-point scale, with a score of 1 for “not at all” and a score of 10 for “absolutely true”. The higher the score, the more highly evaluated is the item.

Table 2. Creation of handouts, self-training implementation rate, patient satisfaction, and self-efficacy.

	Case 1	Case 2	No “Pattore !” group
Creation of handouts			
・Clinical experience of therapist in charge (years)	11	2	8±6
・Mean time required (seconds/ handouts [range])	195±26 [152−221]	245±29 [195−270]	421±158 [220−645]
Results			
・Self-training implementation rate (%)	100	85	70±27
・Patients satisfaction (score)	9.7	7.7	6.9±1.9
・Self-efficacy (score)	10	5.7	6.8±1.2

Patient satisfaction and self-efficacy scores are mean values of three items for the corresponding category.

Time	1. Disease day 24 (admission to convalescent ward)	2. Disease day 31	3. Disease day 40	4. Disease day 47 (before discharge)
Degree of independence	Wheelchair transfer FIM score 5	Wheelchair transfer FIM score 6	T-cane walk in ward FIM score 6	T-cane walk in hospital FIM score 6
FIM subscore	Motor: 57, cognitive: 32	Motor: 62, cognitive: 32	Motor: 64, cognitive: 32	Motor: 73, cognitive: 33
SIAS-motor score	2-3-3-4-3	3-3-4-4-3	4-4-4-4-4	4-4-4-4-4
Walk	T-cane walk, min assistance 6MD: Not done	T-cane walk, supervision 6MD: 80 m	Up & down stairs, min assistance 6MD: 220 m	Up and down stairs, supervision 6MD: 260 m
Objective	Physical activity level maintenance	Muscle strengthening , balance improvement	Exercise tolerance improvement	Establishment of self-management
Handout				

FIM: Functional Independence Measure, SIAS-m: Stroke Impairment Assessment Set-motor, 6 MD: 6-minute walking test, min: minimum

Figure 2. Case 1: progress and handouts.

could be implemented in supine and sitting positions. After the patient achieved independence in transfer, lower limb muscle strengthening and standing balance exercises such as squat were added. Because the muscle tension of the paretic lower limb (Triceps surae) tended to increase excessively with increasing outdoor walking and other activities, instructions of self-management methods such as stretching were given before discharge from hospital.

The self-training implementation rate was 100%, except when the physical condition was poor. The results of the questionnaire survey were patient satisfaction score 9.7 and self-efficacy score 10. The patient’s comments were as follows: “Feel reassured that I won’t forget the menus because I am given the handouts promptly on the spot” and “by continuing self-training I was able to feel that I could use my limbs on the paralyzed side more easily.”

3. Case 2

According to the permited weight bearing on the foot or the degree of ADL independence, the patient was given four self-training handouts at the following timing: (1) one-third weight-bearing (postoperative day 55), (2) two-thirds weight-bearing (postoperative day 71), (3) complete weight-bearing with walker walk FIM score 5 (postoperative day 85), (4) complete weight-bearing with walker walk in ward FIM score 6 (postoperative day 107) (Figure 3).

Training was started with affected hip and knee joint muscle strengthening in non-weight-bearing position, and then lower limb exercise under weight-bearing was added in a stepwise manner according to the change in the allowed weight-bearing status. After complete weight-bearing was allowed, the patient was instructed to perform weight shifting to the left and right in standing position as well as stepping, and was encouraged to learn left-right symmetrical movements. Before discharging from hospital, the menus were changed to those that can be executed even in the confined space of the home environment.

The self-training implementation rate was 85%. The results of the questionnaire survey were patient satisfaction score 7.7 and self-efficacy score 5.7. The patient’s comments were as follows: “It was difficult to understand the effects of self-training” and “I was worried that exercise will worsen the pain in the lower limbs”.

4. No “Pattore !” group

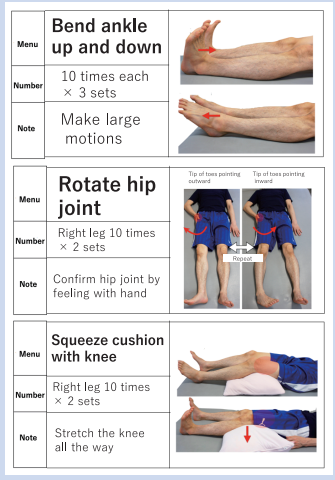
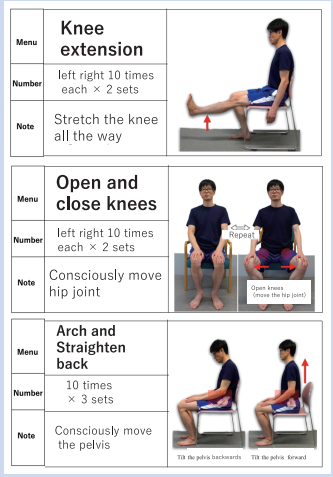
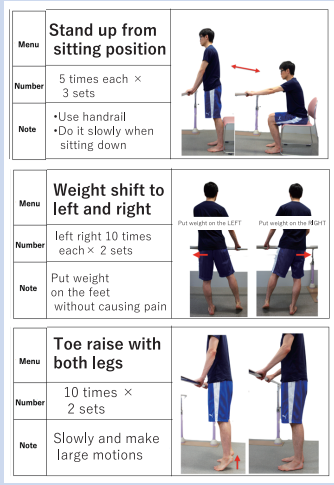
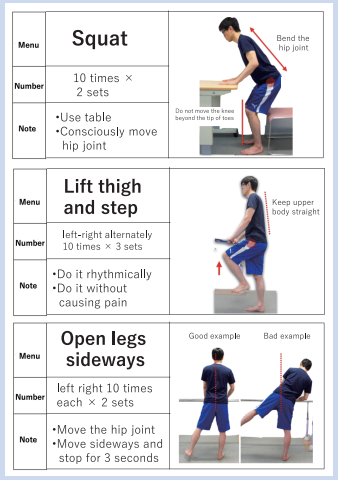
The patient satisfaction score was 6.9 ± 1.9; self-efficacy score was 6.8 ± 1.2; and self-training implementation rate was 70 ± 27%.

Discussion

The utilization of “Pattore !” shortened the time required to create self-training handouts regardless of the therapist’s years of experience. Patient satisfaction scores were 9.7 in Case 1 and 7.7 in Case 2; both scores were higher than that in the no “Pattore !” group (6.9 ± 1.9). Some of the reasons are as follows: utilization of “Pattore !” allowed update of handouts at appropriate timing, and that the layout and drawings were easily understandable even by elderly patients [1]. According to Tanaka and Tokaji [8], customer satisfaction promotes internalization of the value and importance of exercise as well as enhances motivation of self-determination. Therefore, providing handouts with high patient satisfaction is probably an effective method to motivate self-training. On the other hand, self-efficacy score was 10 in case 1 and 5.7. in Case 2, with a difference between the two patients. The self-training implementation rate was 100% in Case 1 and slightly lower at 85% in Case 2, suggesting a relationship between self-efficacy and the self-training implementation rate.

Self-efficacy as proposed by Bandura [3] is defined as one’s belief in one’s capabilities to execute the courses of action. Self-efficacy is affected by four major sources of information (physiological and affective arousal, achievement of actual performance, vicarious experience, and verbal persuasion). Among these four sources of information, physiological and affective arousal is defined as self-perceived physiological state such as physical condition, and is acquired by being aware of changes in everyday life such as “stopped feeling out of breath when climbing up the stairs” [5]. In order that patients perceive such positive effects through exercise therapy, it is important to provide instructions upon setting the environment, difficulty level, and amount of exercise tailored to each individual [15, 16].

Case 1 had mild memory impairment and sometimes forgot the menu. However, he was able to implement self-training effectively by referring to the handouts. In the questionnaire, he responded, “By continuing self-training, I was able to feel that I could use my limbs on the paralyzed side more easily”, indicating that he was able to perceive the positive effect of exercise, which increased his self-efficacy. On the other hand, Case 2 tended to develop knee pain on the affected side, and she was in a psychological state of anxiety toward exercise therapy. In the questionnaire, she responded, “It was difficult to understand the effects of self-training”, indicating that the she did not achieve perception of the exercise effect, which was probably the factor for her inability to achieve high self-efficacy. According to Arita et al. [5], since elderly persons tend to put priority on emotionally meaningful goals, it is essential to set goals that are easy to perceive and understand. In order to increase self-efficacy in Case 2, it would be necessary to design menus that can be implemented without anxiety, and have easily perceivable effects such as pain relief and range of motion improvement [15].

Time	1. Postop day 55 (admission to convalescent ward)	2. Postop day 71	3. Postop day 85	4. Postop day 107 (before discharge)
Weight bearing	1/3 weight-bearing	2/3 weight-bearing	Complete weight-bearing	Complete weight-bearing
Degree of independence	Wheelchair transfer FIM score 6	Wheelchair transfer FIM score 6	Walker walk FIM score 5	Walker walk FIM score 6
FIM subscore	Motor: 63, cognitive: 35	Motor: 67, cognitive: 35	Motor: 70, cognitive: 32	Motor: 75, cognitive: 35
(Affected side)	Hip joint flexion / Hip joint extension	Hip joint flexion / Hip joint extension	Hip joint flexion / Hip joint extension	Hip joint flexion / Hip joint extension
MMT	3 / 2	3 / 2	4 / 3	4 / 4
ROM	75° / -15°	85° / -10°	95° / -5°	100° / 0°
Pain	Weight-bearing (knee) NRS: 4	Weight-bearing (knee) NRS: 3	Weight-bearing (knee) NRS: 2	Weight-bearing (knee) NRS:1
Objective	Relaxation, range of motion maintenance	Lower limb & trunk muscle strengthening	Symmetrical exercise under weight-bearing	Establishment of exercises for home environment
Handout				

MMT: Manual Muscle Testing, ROM: Range of motion, NRS: Numeric Rating Scale, postop: postoperative

Figure 3. Case 2: progress and handouts.

“Pattore !” is an effective tool to enhance the quality of self-training instruction. However, in order to use it effictively, it is necessary to update the handouts at suitable timing based on appropriate evaluation, and to use instruction methods such as feedback and praise so that patients can perceive the training effect. These approaches are expected to improve patient satisfaction and self-efficacy, and promote the implementation and continuation of self-training.

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