

The Outcomes of Seamless Self-care Training between Occupational Therapist and Nurse in Stroke Patients

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ABSTRACT

Objectives: To investigate the outcomes of seamless self-care training to stroke patients by occupational therapists (OTs) and nurses.

Study design: Quasi-experimental research design.

Setting: Rehabilitation ward, Siriraj Hospital, Mahidol University.

Subjects: Thirty-five inpatients with first stroke, normal mental functions and age between 18 to 75 years old, were included in the study. All needed help in dressing and washing oneself activities.

Methods: Participants were divided into two groups. The conventional group received self-care (dressing and washing oneself) training from OTs for 3 days; on day 4, OTs supervised them, thereafter nursing staffs were responsible for such activities in a traditional nursing care until day 14. The experimental group received a "seamless self-care training", in which OTs trained patients for 2 days, supervised them for the next 2 days, and the nursing staffs joined the OTs on day 4 to learn how to facilitate the patients and led the training until day 14. The primary outcome was a normalized gain of the self-care score. Secondary outcomes were a modified Barthel index (MBI) score, self-efficacy, and patient satisfaction. The outcomes were evaluated at baseline (day 1) and after completing the training (day 14).

Results: After adjusting by normalized gain calculation, there were significantly more participants in the experimental group who achieved a higher gain level (0.7-1) than in the conventional group ($p = 0.028$). The experimental group had considerably higher self-efficacy for washing oneself activity after the training ($p = 0.013$) and were more satisfied with the training program than the conventional group. The MBI improved in both groups.

Conclusion: This seamless self-care training with good collaboration between occupational therapists and nursing staffs during inpatient rehabilitation was proved to be effective in dressing and washing oneself training and promoting self-efficacy of stroke patients

Keywords: self-care, nursing care, occupational therapy, inpatient, stroke rehabilitation

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Introduction

Stroke is a leading cause of death and disabilities worldwide. Estimates from the Global Burden of Disease Study in 2017 ranked stroke as the third most common cause of disability-adjusted life-years (DALYs).⁽¹⁾ Despite the development of stroke care, many stroke survivors are left with functional deficits.⁽²⁾ Activities of daily living (ADLs) are essential functions that all survivors need to regain their ability to live independently and their self-esteem, and to alleviate the burden on caregivers. The loss of independency with not being able to perform ADLs contributes to institutionalization and reduces quality of life.⁽³⁾

Rehabilitation is mandatory to promote functional recovery and minimize the distress of stroke survivors as much as possible. Even though rehabilitation outcomes are expected in all aspects, in one study the highest improvements were observed for bowel and bladder functions, transfer, and mobility, while the lowest improvements were seen in bathing (washing oneself), grooming (caring of body parts), dressing, and stair climbing.⁽⁴⁾

Occupational therapists (OTs) are responsible for assessing and teaching skills to facilitate patients' activities and participation, including maximizing their performance of ADLs, and provide training programs and techniques that are tailor-made for each individual's impairment using targeted task-specific training, which has been acknowledged as the most effective method for enhancing functional outcomes.⁽⁵⁻⁷⁾ Nevertheless, the most important key factor for successful training outcomes is the collaboration of multiple healthcare professionals. All team members, especially nurses who spend lots of time with patients, should focus on encouraging and facilitating patients in transferring the newly relearned skills from professionals into their lives. Unfortunately, each expert usually approaches the patients from their own aspects, causing a lack of team perspective that could potentially preclude the patients from achieving their rehabilitation goals.^(6,8)

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In current inpatient rehabilitation practice, there is still a gap in carrying out self-care training. Self-care training is usually carried out by OTs at the occupational therapy unit, whereas nursing staff assists washing and dressing the patients during admission at the rehabilitation ward. Due to time constraints, nurses usually concentrate on preparing the patients to be ready on time for other specific training.⁽⁹⁾ This hinders them from allowing patients the time and opportunity to practice by themselves, resulting in patients' having low confidence and a perception of low self-efficacy. Consequently, some patients may not develop sufficient skills to perform self-care independently after discharge. This situation was reported by Pryor and Long that an integrative function of nurses and other professionals was sub-optimal.^(9,10)

Therefore, in the present study, we aimed to develop and implement an interdisciplinary team model with integration of all the relevant expertise and to establish powerful collaboration and communication among the team. To this extent, we designed a new approach toward self-care training called the "seamless self-care training" technique, which involves enhanced coordination and communication between OTs and nurses in the rehabilitation ward to promote interdisciplinary cooperation in self-care training. We hope that this technique could make therapeutic intervention more successful and fill the gap in treatment processes, as well as to increase the self-efficacies of stroke survivors. The objective of this study was to explore the outcomes of providing this seamless self-care training to stroke patients.

Methods

This quasi-experimental research was conducted in an inpatient rehabilitation setting at the Department of Rehabilitation Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand. All patients included in this study or their legal guardians provided a written informed consent. The Siriraj Institutional Review Board approved the study protocol (SIRB COA no. Si 644/2014), and this study was registered with Clinicaltrial.gov (NCT02361307).

Participants

First-time stroke patients aged 18-75 years old who were able to sit without support and who had never received self-care training were eligible for inclusion in the study. Those who had bilateral weakness, dependent basic self-care support before the occurrence of stroke, cognitive impairment, neglect, apraxia, and depression, were excluded from the study. Upon admission, every patient was screened by the Thai Mental State Examination (TMSE). The cutoff score in the diagnosis of cognitive impairment is a score of less than 24 out of 30.⁽¹¹⁾ Depression was assessed by the Patient Health Questionnaire (PHQ)-9. The cutoff score to determine major depression is more than 9 out of 27.⁽¹²⁾ After a written informed consent was obtained, patients were divided non-randomly into two groups: conventional group and experimental group.

Study protocol

The conventional group received washing oneself and dressing training from the same OT in the occupational therapy unit for 3 days. On the 4th day of training, the OT supervised the patients while performing these tasks in the rehabilitation ward. After that, a nursing staff took responsibility for these activities in a traditional way of nursing care until day 14. Duration of training session was one hour per day.

The experimental group received the new "seamless self-care training" technique, which was characterized by a collaboration between OTs and nurses. The training team consisted of two OTs with standardized training skills according to the self-care checklist for dressing and washing oneself (see appendix). The patients received training in the occupational therapy unit for 2 days and then were supervised by OTs at the rehabilitation ward for the next 2 days. On the 4th day of the training, one nursing staff came along with the OT in order to learn how to facilitate the patients according to their abilities to carry out these tasks. After that, the patients received further training from the nursing staff until day 14. Duration of training session was one hour per day. In this group, the nursing staff guided the patients to perform dressing and washing oneself according to the self-care checklist.

In both groups, each patient was in contact with and trained by only one OT and one nurse throughout the period of the study.

In order to reduce cross-contamination of the training techniques, each technique was delivered in separate periods of time. We first finished collecting data in the conventional group for one month and then conduct the seamless self-care training technique with the experimental group. During the study, patients received physical therapy or other treatments that did not affect dressing and washing oneself abilities.

Outcome measurement

For the main outcome, patients' abilities in dressing and washing oneself were evaluated by another OT on day 1 and day 14 of the program in both groups. However, since there were no specific detailed measurements for assessing such abilities after a stroke, the authors developed steps of dressing and washing oneself, so called "Self-care checklist for dressing and washing oneself" (see appendix). Based on task analysis, these two self-care activities consisted of 5 sequential activities: taking off a shirt, taking off pants, washing oneself, putting on a shirt and putting on pants. Each activity was composed of 4 steps, so there were 20 steps in total. Each step could be scored as 0, 1, or 2. A score of 2 meant the patients could perform the task independently, while 1 meant the patients could do the task with verbal cueing, and 0 meant the patients could not perform the task within 5 minutes or needed assistance to complete the task. Therefore, the maximum score was 40 for the independent performance measurements of dressing and washing oneself. This checklist had a high correlation with the Modified Barthel Index as analyzed with Spearman's correlation $r = 0.764$, $p < 0.001$.

Normalized gain

The raw score from the self-care checklist for dressing and washing oneself was used to calculate the normalized gain. Because stroke patients had varying scores for their initial dressing and washing oneself abilities, their possible window of improvement could be limited by the “floor to ceiling” effect. Therefore, it was considered that their improvements should be assessed by the normalized gain, which was introduced by Hake in 1998 as a rough measure of the effectiveness of a training course and has since become the standard method for reporting scores. Hake defined the normalized gain (g) as the ratio of the actual gain to the maximum possible gain,⁽¹³⁾ as given in the equation:

$$\text{Normalized gain (g)} = \frac{(\text{post-training}) - (\text{pre-training})}{(\text{maximum score}) - (\text{pre-training})}$$

With a possible value between 0.0–1.0, the normalized gain can be divided into 3 levels: “high-g” for $g \geq 0.7$, “medium-g” for $0.3 \leq g < 0.7$, and “low-g” for $g < 0.3$.⁽¹⁴⁾

Modified Barthel Index (MBI) was used to assess the functional tasks of ADL by OTs. The score ranged from 0–20. The higher the score, the more independence the patients had in performing the ADL functions.⁽¹⁵⁾

Dressing and washing oneself time was measured from taking off a shirt until finished putting on pants. The shorter duration, the more capability one had.

Self-efficacy was rated by each patient using a numerical rating scale (NRS) in order to measure a self-perceived self-care ability level. The score ranged from 0–100. The higher the score, the more confidence one had in one own capability.

Patient satisfaction was evaluated by each patient using a numerical rating scale (NRS) for assessing one’s contentment with the self-care training approach. The score ranged from 0–100. The higher the score, the more satisfied they were.

All the variables were assessed on day 1 and day 14 except dressing and washing oneself time that was assessed in the rehabilitation ward on day 7 and day 14 after the training was completed.

Sample size calculation

The minimum required sample size was calculated based on the outcomes of occupational therapy in the ward, in which 30% of stroke patients would show improved dressing and washing oneself abilities within 2 weeks after undertaking a conventional training. We estimated that the outcome of the seamless self-care training would be more patients gaining in such abilities, reaching up to 80%. Based on this estimation and allowing for a 5% error, a minimum sample size of 15 cases was calculated for each group, for 30 cases in total. For compensation to allow for a possible 20% dropout, 36 cases were studied in total.

Statistical analysis

Demographic and clinical variables were summarized using descriptive statistics. Continuous variables were des-

cribed as mean with standard deviation (SD) and median with an interquartile range (IQR). Categorical variables were described by frequency and percentage. Statistical data analysis was performed using SPSS, Version 18.0, and a p -value < 0.05 was considered to be statistically significant. The differences in the outcome of self-care training and self-efficacy between the two groups were analyzed by independent t-test, or within group by paired t-test, while differences between groups covariate by day 1 were analyzed by analysis of covariance (ANCOVA). The gain level was analyzed by chi-square test for assessing trends.

Results

In total, 36 stroke patients participated in the study. One participant discontinued the program after the first day of training due to a medical condition, leaving 35 participants who received the allocated intervention. There were no adverse events in this trial. The participants’ mean age was 58.3 (SD 10.5) years old and 21 (60%) of them were male (Table 1). Most participants (97.3%) were right handed, while 48.6% had right-side weakness. All participants needed assistance with dressing and washing oneself.

The outcome self-care scores were measured at baseline (day 1) and at day 14. After adjusting by the normalized gain calculation, significantly more participants in the experimental group achieved a higher gain level (0.7–1) than in the conventional group ($p = 0.028$). Comparing the dressing and washing oneself time taken on day 7 and day 14, both groups showed reduced time spent on both activities. The experimental group showed significant improvements washing oneself time ($p = 0.038$) (Table 2). There were no between-group differences in the improvement of MBI scores. After 2 weeks of training, participants in the experimental group, rated their self-efficacy in washing oneself as significantly higher [88.8 (SD 14.1) vs. 77.2 (SD 12.8), $p = 0.013$] (Table 3), and they were more satisfied with the training program than participants in the conventional group [97.9 (SD 5.3) vs. 88.3 (SD 13.8)].

Discussion

The aim of this study was to explore the outcomes of applying the seamless self-care training technique. The keystone of this technique is the strengthened collaboration between OTs and nurses in coaching stroke survivors to complete dressing and washing oneself training. The collaboration facilitates the systematic transfer of skills related to the training from a therapy room to a real setting of a patient’s daily routine.

The results from this study indicated that this technique could enhance the effectiveness of training and achieving functional gains, a decrease in washing oneself time, and an increase in washing oneself self-efficacy. Although both groups received the same total training time of 14 days, the

Table 1. Demographic data of all 35 study participants

Variables	Experimental group (n=17)	Conventional group (n=18)
Age, years ¹	57.1 (10.3)	59.4 (10.9)
Stroke type ²		
- Ischemic	15 (88.2)	14 (77.8)
- Hemorrhage	2 (11.8)	4 (22.2)
Side of weakness ²		
- Right	7 (41.2)	10 (55.6)
- Left	10 (58.8)	8 (44.4)
Dominant hand ²		
- Right	16 (94.1)	17 (94.4)
- Left	1 (5.9)	1 (5.6)
Gender ²		
- Male	10 (58.8)	11 (61.1)
- Female	7 (41.2)	7 (38.9)
Duration of stroke, days ³	16 (12, 35)	26 (16, 58)
Educational level ²		
- Less than 12 years	10 (58.8)	10 (55.6)
- At least 12 years	7 (41.2)	8 (44.4)
Comorbidities ²		
- DM	7 (41.2)	9 (50.0)
- HT	15 (88.2)	15 (83.3)
- DLP	12 (70.6)	13 (72.2)
- Heart disease	6 (35.3)	2 (11.1)

¹Mean (SD), ²number (%), ³median (IQR 25, 75)

Table 2. Outcomes of the self-care (dressing and washing oneself) training

Outcomes		Experimental group (n=17)	Conventional group (n=18)	p-value ^b
Total self-care score ¹	D1	29.6 (6.7)	31.2 (7.6)	0.519
	D14	39.3 (1.4)	37.2 (3.8)	0.003 ^c
p-value ^a		0.000	0.000	
Normalized gain D14 ¹		0.96 (0.1)	0.71 (0.3)	0.005 ^c
High gain ² (0.7–1)		17 (100)	13 (11.1)	0.028 ^c
Medium gain (0.3 ≤ g < 0.7)		0	2 (16.7)	
Low gain (< 0.3)		0	3 (72.2)	
MBI ¹	D1	8.8 (1.6)	7.6 (1.9)	0.036 ^c
	D14	11.4 (0.9)	11.1 (1.3)	0.524
p-value ^a		0.000	0.000	
Washing oneself time, min ¹	D1	8.34 (2.2)	8.12 (3.3)	0.729
	D14	6.44 (1.4)	7.24 (3.2)	0.457
p-value ^a		0.000	0.010	
ΔWashing oneself time D7–D14, min ¹		1.50 (1.4)	0.47 (1.1)	0.038 ^c
Dressing time, min ¹	D1	4.45 (2.6)	2.45 (1.5)	0.022
	D14	3.52 (3.1)	2.21 (1.4)	0.082
p-value ^a		0.001	0.007	
ΔDressing time D7–D14, min ¹		0.52 (0.6)	0.23 (0.3)	0.073

¹Mean (SD), ²number (%); ^ap-value within group, ^bp-value between groups, ^csignificant at p < 0.05

Table 3. Dressing and washing oneself self-efficacy

Activity	Day of training	Experimental group (n=17)	Conventional group (n=18)	p-value ^b
Washing oneself ¹	D1	72.9 (14.9)	80.0 (14.6)	0.166
	D14	88.8 (14.1)	77.2 (12.8)	0.013 ^c
	p-value ^a	0.0054	0.516	
Dressing ¹	D1	74.1 (15.4)	77.8 (17.0)	0.510
	D14	90.9 (10.3)	82.2 (15.2)	0.065
	p-value ^a	0.0044	0.392	

¹Mean (SD), ^ap-value within group, ^bp-value between groups, ^csignificant at p < 0.05

experimental group received 3.5 times (14 days vs. 4 days) more practicing time under professional training procedure by OTs and nurses than the conventional group. Because the experimental group received seamless training technique utilizing the self-care checklist for dressing and washing oneself and promoting better communication between professionals, while the conventional group received training in routine approach, not using checklist and no enhanced coordination. As washing oneself is a complicated task requiring more practice than dressing, the seamless self-care training technique was more beneficial for washing oneself. These findings are congruent with the dose-response relationship concept. Participants who performed the tasks more often could obtain more skills and gain more self-efficacy.^(7,16) Self-efficacy is an individual's perceived confidence and belief in their capabilities to perform specific tasks or actions and is an important key for successful rehabilitation. Further, self-efficacy is associated with various outcomes, such as physical functioning, including ADL performance, depression, quality of life, and patient satisfaction.^(17,18) In addition, Kobylańska found that patients who lacked self-efficacy tended to have low functional abilities in post-stroke rehabilitation.⁽¹⁹⁾ Therefore, well-designed training techniques could empower the patients and enhance their sense of competence.

In our study, we created the seamless self-care training technique under an interdisciplinary team working model. Regarding the total treatment time in rehabilitation units, rehabilitation nurses spend much more time with patients compared to OTs.⁽¹⁶⁾ Therefore, we encouraged nursing staff to play an important role as a facilitator for patients when assisting self-care activities instead of their traditional role as a care provider, providing nursing care. A previous study reported that the main reason nurses do everything for patients in almost all activities rather than facilitating them is that the latter is too time consuming. Because of time constraints, especially in the morning, nurses tend to be more concerned about preparing patients to be ready for specific training with other professionals and some nurses perceive that other professionals are predominantly responsible for the rehabilitation processes. Moreover, many patients and families still have expectations that nurses should provide a basic nursing care for them.^(9,10,20)

In this study, we measured the time that patients took when trying to do the tasks by themselves. Both groups spent around 10 minutes to complete dressing and washing oneself. From our observation, this only took 5 minutes when performed by nurses in routine care; meaning it took twice as long to achieve the same tasks. Although this study showed the benefit of the seamless self-care training technique, the possibility of putting this approach into practice would need to consider nursing staff's workload. However, another study found that a formal stroke rehabilitation education program could change the interaction between nurses and patients from doing things for them to facilitating them to do things for

themselves without any increase in time.⁽²¹⁾ Leaders should be strong and coach teams to adhere to goal-oriented outcomes and develop a suitable strategy for their effective time management.⁽²²⁾ On the other hand, if nurses and OTs have a lot of contact time with patients they should have the time to provide patients with meticulous training, which could raise patient satisfaction, which in this study was 9.6% higher in the experimental group than in the conventional group. This might be one factor that could contribute to patients gaining more advanced functional skills. This finding complements the existing research mentioning that higher patient satisfaction is associated with better compliance and outcomes.⁽²²⁾

The key strength of the seamless self-care training is the greater apparent collaboration between team members than in traditional training, in which no specific time is identified for OTs to work alongside nurses in providing self-care training. With collaboration, the nurse could provide crucial information feedback to the OT, and vice versa, and this could enable them to adapt their care plan accordingly. Moreover, the self-care checklist for dressing and washing oneself was developed in this study to measure the progression of washing oneself and dressing training. This was validated and could be used to aid communication among rehabilitation professionals.

Even though this study showed an improvement in the self-efficacy of participants, a long-term outcome was not followed and a burden on caregivers was not explored. We suggest extending the study into the potential of the seamless self-care training technique to assure its full effects.

In conclusion, this seamless self-care (dressing and washing oneself) training technique is a unique interdisciplinary working model has been proved to be effective. However, translating it into rehabilitation practice could be challenging for changing each discipline mindset for more collaboration and integration.

Disclosure

All authors declare no personal or professional conflicts of interest.

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Appendix

Self-care checklist for dressing and washing oneself
Instruction: Scoring 0 = complete assistance needed, 1 = require verbal cue for completing task, 2= not require assistance
Patient's abilities in washing oneself and dressing
Taking off the button shirt
1. Slightly take shirt off affected shoulder
2. Take shirt off unaffected shoulder
3. Pull shirt off unaffected arm
4. Pull shirt off affected arm
Total score
Taking off pants (choose either A or B which compatible with patient's ability)
A. In standing position (for a patient who needs minimal assistance in transferring)
1. Stand up and pull pants down to knee level
2. Sit at the edge of the bed
3. Remove pants from unaffected leg
4. Remove pants from affected leg
B. In supine position (for a patient who needs moderate assistance in transferring)
1. Lie on one side or raise the hip in supine position then pull pants down to knee level
2. Sit at the edge of the bed
3. Remove pants from unaffected leg
4. Remove pants from affected leg
Total score
Putting on pants (choose either A or B which compatible with patient's ability)
A. In standing position (for a patient who needs minimal assistance in transferring)
1. Sit and cross affected leg over unaffected leg
2. Put pants on affected leg then pull pants up above knee level
3. Put pants on unaffected leg
4. stand up and use unaffected arm to pull pants up to waist level
B. In supine position (for a patient who needs moderate assistance in transferring)
1. Sit and cross affected leg over unaffected leg, put pants on affected leg
2. Put pants on unaffected leg then pull pants up as high as possible
3. Lie down on bed in supine position
4. Lie on one side or raise the hip in supine position then use unaffected arm to pull pants up
Total score
Putting on shirt
1. Properly lay down the shirt to put on
2. Put the shirt on affected arm
3. Use unaffected hand to pull the shirt up to the shoulder, move the rest of the shirt behind the body
4. Put the shirt on unaffected arm
Total score
Washing oneself
1. Turn on the faucet, use shower head/water dipper to wet the entire body
2. Rub the soap onto entire body, with or without assistive devices
3. Wash the soap from the body thoroughly
4. Dry the body thoroughly
Total score
Sum score