


Creative art therapy to enhance rehabilitation for stroke patients: A randomized controlled trial

Clinical Rehabilitation
1–8
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DOI: 10.1177/0269215515607072
cre.sagepub.com


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Abstract

Objective: To examine the efficacy of creative art therapy plus conventional physical therapy, compared with physical therapy only, in increasing cognitive ability, physical functions, psychological status and quality of life of stroke patients.

Design: Randomized controlled trial with blinded assessor.

Setting: An in-patient setting

Participants: One hundred and eighteen stroke patients aged ≥ 50 years who could communicate verbally.

Interventions: All participants received conventional physical therapy five days per week. An intervention group received additional creative art therapy, twice a week for four weeks, in a rehabilitation ward.

Main outcomes: Cognitive function, anxiety and depression, physical performance and quality of life were measured with the Abbreviated Mental Test, the Hospital Anxiety and Depression Scale, the modified Barthel Index scale and the pictorial Thai Quality of Life questionnaire, respectively.

Results: Mean differences for the intervention group were significantly greater than the control group for depression (-4.5 , 95% CI -6.5 , -2.5 , $p < 0.001$), physical functions (1.2 , 95% CI 0.1 , 2.3 , $p = 0.043$) and quality of life (8.9 , 95% CI 3.8 , 13.8 , $p < 0.001$). Compared with baseline measures, both groups experienced improved cognition, physical functions and quality of life and reduced anxiety and depression. Eighty-five percent of patients were satisfied with the creative art therapy and most reported improved concentration (68.5%), emotion (79.6%), self-confidence (72.2%) and motivation (74.1%).

Conclusion: Creative art therapy combined with conventional physical therapy can significantly decrease depression, improve physical functions and increase quality of life compared with physical therapy alone.

Keywords

Creative art therapy, stroke, activity of daily living, depression, quality of life

Received: 10 May 2015; accepted: 29 August 2015

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Introduction

Creative art therapy is a psychological therapy that includes various activities (e.g. meditation, art, dance, acting, puppetry and storytelling) combined with music therapy. After stroke, patients are often experiencing emotional disturbance in addition to motor loss and that creative art therapy might well help with this.

The focus of creative art therapy is not artistic or musical skills per se, but non-verbal and symbolic communication and expression and the conveyance of complex ideas, emotions and feelings.¹ Art therapy helps patients express their feelings via body language, speech, pictures, language and symbols that reflect their life experiences. The creative process of making art contributes to healing and enhances quality of life, which is composed of multidimensional aspects such as physical, emotional, social function, economic, and so on.²

Creative art therapy can be used as a form of group therapy to promote patient interaction and communication.³ There are evidences that creative art therapy can reduce anxiety, depression and isolation among stroke patients, helping them to express internal conflicts, emotions and psychological status through artworks, and facilitating healing of mental health problems.^{4,5} A systematic review of creative activities indicated that they have a healing and protective effect on mental well-being and can promote relaxation, provide a means of self-expression, reduce blood pressure, boost the immune system and reduce stress.⁶

Creative therapies are currently prescribed as a remedy of various health problems, such as psychiatric illness,^{7,8} stroke^{4,5,9,10} brain tumors,¹¹ breast cancer,¹² dementia^{13,14} and for palliative care in cancer patients.^{15–17} They can be used as a complementary treatment for depression even in children.¹⁸ However, the main diagnosis of patients in our rehabilitation wards was stroke. Some stroke patients have stress, depression, anxiety and loss of self-esteem, which was associated with poor quality of life.^{19–21} Although there may be some evidence for benefit of creative art therapy, no studies have yet investigated its use in stroke and therefore this study is justified.

Methods

This study is a randomized controlled trial with pre and post intervention measures. The study protocol was in accordance with the ethical standards of the Declaration of Helsinki, 1976 (revised Hong Kong, 1989), and was approved by the ethics committee of Siriraj Hospital (Approval number 118/2554; EC 3). Patients and/or their relatives provided written informed consent.

Recruitment procedure

The authors recruited stroke patients admitted to the hospital rehabilitation ward. The inclusion criteria were stroke patients aged more than 50 years, who could communicate verbally (answer question reasonably), and willingness to cooperate with the study. Subjects with unstable medical conditions, history of severe dementia and uncontrolled behavior such as agitation or confusion were excluded from the study. Termination criteria were severe adverse events or patient withdrawal. Randomization was carried out by using computerized random numbers which were kept concealed in opaque envelopes. Then, participants were allocated in the study or control groups by a research assistant who was only involved in participant enrollment.

Baseline assessment

The baseline data were recorded including age, sex, educational level, comorbidities, onset, type and involvement of stroke. Several outcome measures were assessed at baseline. The Abbreviated Mental Test was used to evaluate cognitive functions.²² This comprises of 10 questions that respondents must correctly answer (e.g. “What is your age?” and “What is the year?”). The score range is 0–10; higher scores indicate better cognition. The modified Barthel Index was used to evaluate functional scores of 10 basic activities of daily living with the maximum score of 20.²³ It has been used frequently for assessment in stroke rehabilitation especially in research. Barthel Index is also reliable and consistent with other instruments.^{24,25} The functions assessed by Barthel Index are bowel control, bladder

control, personal hygiene, toilet transfer, bathtub transfer, feeding, dressing, wheelchair transfer to and from bed, walking (wheelchair management if patient is non ambulatory), and ascending and descending stairs. The Hospital Anxiety and Depression Scale was used to assess psychological status detecting anxiety and depression dimensions.²⁶ We chose Thai version of Hospital Anxiety and Depression Scale because it is a reliable and valid tool for the anxiety and depression screening for Thai patients.²⁷ It composes of 14 items with even items for anxiety assessment and odd items for depression. The score ranges from 0–21; scores >11 indicates psychological disorder. Additionally, quality of life was evaluated using the pictorial Thai Quality of Life questionnaire which is composed of 6 dimensions including physical, cognitive, affective, social function, economic and self-esteem dimensions.²⁸ The score ranges from 0–72; higher scores indicate a better quality of life. The pictorial Thai Quality of Life questionnaire is a feasible questionnaire for assessment of the perceptions and concerns of patients. It has desirable properties in reliability and validity with the WHOQOL-BREF questionnaire.²⁸

Interventions

All participants received a conventional physical therapy program five days per week (20 sessions) conducted by a physical therapist. This consisted of a range of motion exercises for the paralyzed limb, strengthening exercises for the sound limb, balancing exercises and ambulation training for 1–2 h per day. The intervention group alone received additional creative art therapy, twice a week for four weeks (8 sessions) in the rehabilitation ward. Each session of creative art therapy lasted 1.5–2 h and involved groups of 5–10 patients. The creative activities were designed to stimulate and benefit cognition, physical state, emotion, communication, social relations and spiritual dimensions.^{29,30}

There were five stages to the creative art therapy: meditation with music, warm-up activity, main activity and group singing activity, ending with a group-healing circle. The aims of the meditation with music were to calm participants and

encourage their concentration. The subsequent warm-up activity, which introduced the main activity, familiarized participants with the tool and art activity theme before starting each main activity. Both activities helped participants get used to the art mediums and the ambience of the group therapy. The main activity of each session was composed of eight art process-based activities (details in Supplementary Appendix). Therapists provided one main activity for each session for a total of eight sessions per course.

During the session, the creative art therapist's role was to encourage patients to participate in the creative art processes and express their creativity in a safe and relaxed setting. Positive thinking about their capability to create art, their ability to reflect and share stories, and to share the inspiration behind their art with others are keys to empower patients during these creative art activities. In the group singing activity, which was a form of indirect self-expression, patients were encouraged to sing along with a range of cheerful songs. Every patient was asked to choose his or her favorite meaningful sentence from the song lyrics and explain the reason to the group. Patients had an opportunity to express their feelings (including any stress) as well as to improve their mood through their song selection.

Before ending each session, a "healing circle", was performed, which was a ceremony designed to increase patients' spiritual strength through a breathing meditation accompanied by calm music. Patients were asked to make a wish and to dedicate the merit to themselves and to others for whom they cared. This ceremony was a form of the Buddhist practice of dedicating to others merit accumulated through virtuous deeds. Its aim was to enhance self-compassion, which is a crucial component of self-healing. At the very end of the session, patients were asked to reflect on their experience of it, and express the feelings and their thoughts.

Data collection

After 4 weeks of treatment, participants were assessed for all outcome measures by co-author

who was masked from the intervention which the patients received. The outcome measures included the Abbreviated Mental Test, the Modified Barthel Index, the Hospital Anxiety and Depression Scale, and the pictorial Thai Quality of Life questionnaire. In addition, at the end of the study, we evaluated satisfaction, concentration, positive emotion, self-confidence and self-motivation of patients in the intervention group by using single sentence questions concerning to these purposes. An analysis including drop-outs gave similar results (Supplementary Table).

Data analysis

The statistical analysis was performed using PASW Statistics 18.0 (SPSS Inc., Chicago, IL., USA). Differences between the two groups were analyzed using unpaired *t*-tests for continuous data and chi-square tests for categorical data. Paired *t*-tests were used to analyze changes in the Abbreviated Mental Test, the Modified Barthel Index, the Hospital Anxiety and Depression Scale, and the pictorial Thai Quality of Life scores from baseline to week 4. The mean differences with 95% confidence intervals (95% CI) of changes in those scores between the two groups were compared using unpaired *t*-tests. Statistical significance for all tests was set at $p < 0.05$. All outcomes were performed by a per-protocol analysis.

Results

Fifty-two subjects were screened out and the reasons were detailed in Figure 1. One hundred and eighteen subjects were randomly allocated to receive either creative art therapy combined with conventional physical therapy (intervention group) or conventional physical therapy only (control group). Five patients were lost from the intervention group. Outcome data for 54 and 59 patients in the intervention and control groups, respectively, were analyzed. Participant characteristics at baseline were similar for the two groups, including age, sex, education level, comorbidities, first attack of stroke, infarction pathology, having surgery for stroke, side involvement, the Abbreviated Mental

Test, the Modified Barthel Index, the Hospital Anxiety and Depression Scale, and the pictorial Thai Quality of Life scores (Table 1).

Table 2 shows the outcome data at 4 weeks, change scores from baseline and mean difference (95%CI) of change scores between groups for all outcome measures which were analyzed by per-protocol analysis. We found that mean differences for the intervention group were significantly greater than for the control group for functional score (1.2, 95% CI 0.1, 2.3, $p = 0.043$), depression (-4.5, 95% CI -6.5, -2.5, $p < 0.001$) and QoL scores (8.9, 95% CI 3.8, 13.8, $p < 0.001$), but there were no differences between groups in AMT ($p = 0.287$) and anxiety scores ($p = 0.123$).

The mean number of creative art sessions that intervention group participants received was 4.7 (SD = 1.9) and 60% of participants received at least five creative art sessions. For patients' evaluation of the creative art therapy program in the intervention group, most subjects evaluated themselves as having improved concentration (68.5%), emotion (79.6%), self-confidence (72.2%) and motivation (74.1%). Fewer patients reported no difference (range = 14.8–25.9%) or reported differences they felt were unrelated to the therapy (range 3.7–11.1%). None of the patients reported feeling worse after the therapy. Of the intervention group, 46 (85.2%) participants were satisfied with the creative art therapy program (data not presented).

Discussion

Our study shows that creative art therapy twice a week combined with conventional physical therapy five times per week for four weeks decreases depression, improves function and quality of life. Studies of creative art therapy to enhance treatment in patients with neurological diseases indicate that creative art therapy can reduce depression, influence well-being and protect against isolation and lack of hope.^{14, 31} Ozdemir and Akdemir have demonstrated that creative art therapy has positive effects on cognition, depression, and anxiety measured by the Mini Mental State Examination, Geriatric Depression Scale, and Beck Anxiety Scale, respectively.³¹ They also found that the

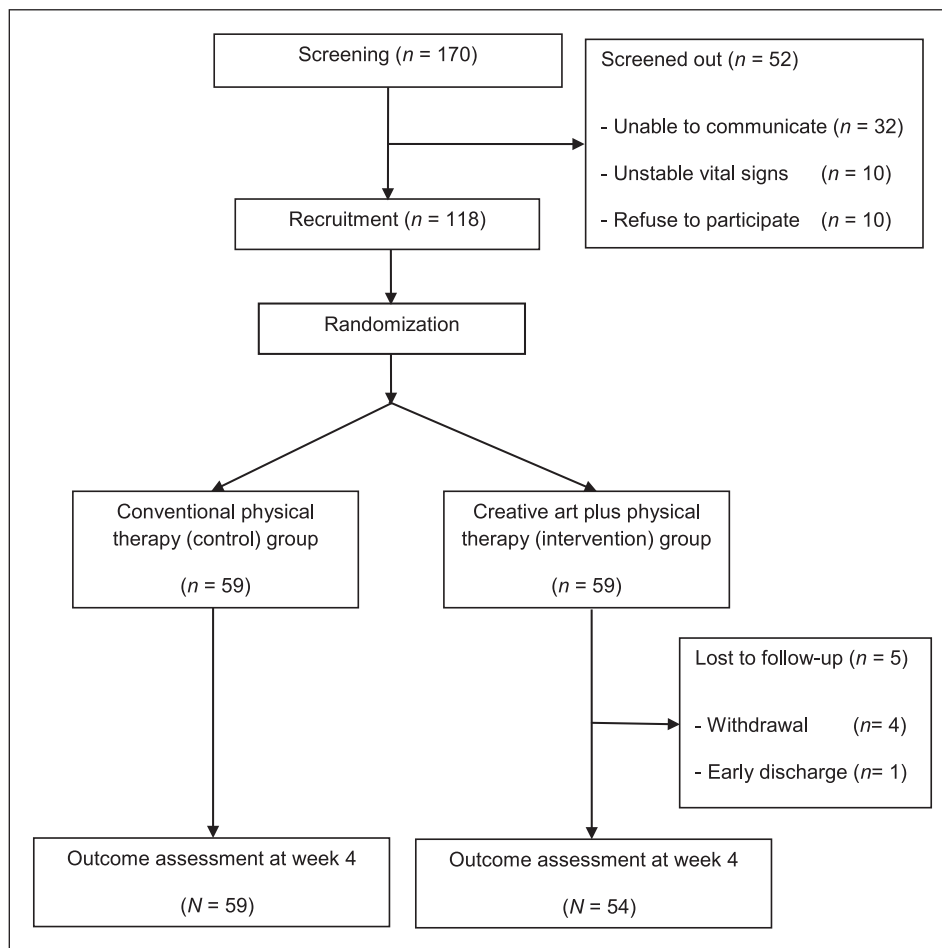


Figure 1. Flow of participants through the study.

effects of creative art therapy lasted for three weeks after the study and had a tendency to decline progressively.

Several studies have investigated the effects of creative art therapy in stroke patients. Sit et al. reported that creative art therapies in stroke rehabilitation can enhance patients' sense of enjoyment and self-expression, strengthen their connections with and appreciation of other people and promote holistic well-being.⁹ Ali et al. demonstrated that creative art therapy reduced isolation and anxiety among stroke patients using group discussions that allowed patients to express their feelings of frustration and hope for recovery after receiving creative

art therapy for six weeks.⁴ Kelly et al. used creative art therapy as a complementary therapy for women with chronic conditions living in a rural area. Participants agreed that creative art therapy helped to reduce pain and increased overall well-being, indicating that it is an important method for enhancing coping skills in patients with chronic illness.³²

The creative art therapy can improve not only psychosocial aspect, but also functional score. However, there has been limited evidence of creative art therapy research study about benefit of physical function. A study by Morris et al. investigated the effect of creative art therapy in 80 hospital stroke rehabilitation patients.¹⁰ Participants

Table 1. Demographic characteristics of participants at baseline.

Demographic characteristics	Conventional physical therapy (n = 59)	Creative plus physical therapy (n = 59)	p-value ^a
Sex: Female, n (%)	31 (52.5%)	32 (54.2%)	0.854
Age: mean (SD)	65.5 (9.9)	67.1 (9.2)	0.339
Education: Primary level, n (%)	28 (47.5%)	20 (33.9%)	0.134
Comorbidities, n (%)			
Diabetes Mellitus	26 (44.1%)	19 (32.2%)	0.185
Hypertension	49 (83.1%)	53 (89.8%)	0.282
Dyslipidemia	37 (62.7%)	48 (81.4%)	0.024
Cardiac disease	8 (13.6%)	7 (11.9%)	0.782
Onset: First attack, n (%)	38 (64.4%)	43 (72.9%)	0.321
Pathology: Infarction, n (%)	46 (78.0%)	47 (79.7%)	0.822
Surgery: Yes, n (%)	6 (10.2%)	2 (3.4%)	0.272
Involvement: Left side, n (%)	39 (66.1%)	33 (55.9%)	0.257
AMT score (0–10), mean (SD)	8.3 (1.9)	7.7 (2.6)	0.140
Modified Barthel Index (0–20), mean (SD)	8.4 (4.2)	9.1 (4.0)	0.359
HADS score: anxiety (0–21), mean (SD)	6.5 (3.7)	6.4 (4.6)	0.877
HADS score: depression (0–21), mean (SD)	9.8 (5.0)	10.7 (5.8)	0.361
Pictorial Thai QoL score (0–72), mean (SD)	33.3 (12.6)	31.7 (14.4)	0.519

^aUnpaired *t*-test for continuous data, chi-square test and Fisher's exact test for categorical data.

AMT: Abbreviated Mental Test; HADS: Hospital Anxiety and Depression Scale; QoL: Quality of Life.

Table 2. Mean (SD) of the outcome data at 4 weeks, change scores from baseline and mean difference (95%CI) of change scores between groups analyzed by per-protocol analysis.

Outcome variables	Conventional physical therapy (n = 59)		Creative plus physical therapy (n = 54)		Mean difference (95% CI)	p-value ^a
	At 4 weeks	Change score	At 4 weeks	Change score		
AMT score	8.7 (1.5)	0.4 (1.3)	8.3 (2.5)	0.6 (1.2)	0.2 (-0.2, 0.7)	0.287
BI score	11.9 (3.9)	3.5 (2.9)	13.8 (3.5)	4.7 (3.2)	1.2 (0.1, 2.3)	0.043*
HADS score: anxiety	4.5 (3.5)	-2.0 (2.9)	3.3 (3.1)	-3.1 (4.6)	-1.1 (-2.6, 0.3)	0.123
HADS score: depression	7.9 (4.9)	-1.8 (3.9)	4.4 (4.0)	-6.3 (6.5)	-4.5 (-6.5, -2.5)	<0.001*
Pictorial Thai QoL score	42.0 (15.1)	8.6 (11.5)	49.6 (12.7)	17.5 (14.9)	8.9 (3.8, 13.8)	<0.001*

^aUnpaired *t*-test. *Statistically significant.

AMT: Abbreviated Mental Test; BI: modified Barthel Index score; HADS: Hospital Anxiety and Depression Scale; QoL: Quality of Life.

received up to eight sessions: four group sessions and four individual sessions. The control group received only the usual care. Their primary outcome was stroke-related health status and secondary outcomes were mood, self-esteem, self-efficacy, perceived recovery and hope. All outcomes were

measured at baseline, post-intervention and three months later. The stroke-related health status of their study was assessed by the Stroke Impact Scale. It is a 8-dimension measure of health status including strength, hand function, activities of daily living, mobility, communication, emotions,

memory and thinking and participation and/or role function that are highly correlated with Barthel Index. Unfortunately, this study is not yet completed.

In addition to the psychological effect of creative art therapy, our study demonstrates an improvement in quality of life similar to that found in the study of Visser and Op 't Hoog.² They investigated the effects of creative art therapy on general quality of life in cancer patients. Participants reported satisfaction with the program and felt that they experienced positive changes in coping with emotions, experiencing meaning in life and creativity. Additionally, a study by Kim and Kang examined creative art therapy for stroke patients with physical disabilities and their caregivers, who suffered from mental instability. Their interventions were participants received two hours of color therapy per week for two months (16 sessions) and were followed up at five months after the last therapy session. They found that art therapy was a beneficial adjuvant therapy to improve quality of life and sense of purpose in life for stroke patients and their caregivers.³³ Although participants in our study received only eight sessions of creative art therapy, they experienced improved quality of life and most were satisfied with the creative art therapy program. They also reported improvements in concentration, emotion, self-confidence and motivation.

However, there were some limitations of the study. 1) As a primary outcome measure, the AMT could not detect changes in cognition. This may be because of the small sample size or higher AMT scores at baseline in both groups. Although it may not improve cognition, creative art therapy may benefit other psychological states more than it does cognition and may increase feelings of happiness during participating creative art therapy. Happiness is one crucial indicator of life satisfaction.³⁴ Furthermore, it can represent prominent aspect of the quality of life.³⁵ 2) The design of creative art activities requires the expertise of creative art therapists, and program application needs to be individually tailored to patients' conditions and needs. 3) This study examined the effects of creative art therapy over a four-week period; therefore, more research needs to be conducted on the long-term effects of this type of therapy. 4) In addition, this

study did not have any control for the extra attention and time offered. Future studies should have some other form of attention control, such as involvement in educational activities.

Clinical messages

- Creative art therapy, twice a week, combined with conventional physical therapy, five days per week for four weeks, can significantly decrease depression, improve function and quality of life scores.
- Most participants were satisfied with the creative art therapy program and experienced improved concentration, emotion, self-confidence and motivation post-therapy.

Acknowledgements

The authors would like to thank the staff of Artfield Art Therapy and the staff of the Recreational Unit of the Faculty of Medicine Siriraj Hospital for help with conducting the research. The authors would also like to thank Ms. Julaporn Pooliam for her good assistance with the statistical analysis.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was supported by the National Research Council of Thailand.

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