Arts-Based Interventions to Enhance the Quality of Life

and Cognition of the Elderly with Mild Cognitive Impairment

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Abstract

This art activities program was designed to enhance the aesthetics, mood, cognition, and quality of life (QoL) of elderly patients with mild cognitive impairment (MCI). The control group was given a single session of MCI knowledge, whereas the intervention group attended weekly art activities, based on visual thinking strategies, combined with cognitive development of aesthetic experience and contemplative arts for six weeks. There was no difference between the Thai Geriatric Depressive Scale (TGDS) scores or Montreal Cognitive Assessment (MoCA) scores between the two groups. However, the intervention group showed statistically significant improvement of Quality of Life, compared to the control group ($P<0.01$), as did the letter fluency, delayed recall, and World Health Organization Quality of Life (WHOQOL) scores ($P<0.05$). Famous paintings used in the study included: Painting Breathes Life into Sculpture, v.1, Snap the Whip, and The Hunters in the Snow (Winter).

Keywords: *Art Program, Aesthetics Inquiry, Quality of Life, Mild Cognitive Impairment, Visual Thinking Strategies, Transformative Art Learning, Elderly, Geriatric, Thailand*

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Introduction

Art Activities and Mild Cognitive Impairment

It has been projected that the number of elderly in Thailand (age 65 or older) will increase approximately 17.5 percent from 2019 to 2050. Elderly with amnesia are at risk of developing dementia, with an increase from 617,000 in 2016 to 1,350,000 in 2037 expected, with Alzheimer's being the majority (Guidelines for Civil Service Inspection of the Ministry of Public Health for the Fiscal, 2020).

Mild Cognitive Impairment (MCI) is the transitional stage, before a full diagnosis of Alzheimer's Disease (AD). According to the diagnostic criteria of The International Working Group on MCI, the elderly with MCI will have a significant subjective and objective impairment of memory, or other aspects of the cognitive domain, with either preserved or minimally impaired instrumental ability, which, overall, is inappropriate and insufficient for a diagnosis of full dementia. Cognitive training in the Instrumental Activities of Daily Living (ADL or IADL) has been found to be effective in preventing or reducing the risk of conversion to dementia (Bherer, 2015).

Art can be thought of as soft power. It is an important thing for life. It helps reflect emotions, values, and opinions. Moreover, art is a tool for communicating, to reach and connect with people in various ways (Binson, 2022).

Aesthetic inquiry is one tool for investigating and appreciating oneself. In addition, it may transform people's thoughts, emotions, and motivation (Thoresen, 2017). Cowl and Gaugler (2014) indicated that creative art activity helps balance the behaviors and mood of both the elderly and their caretakers, since it engages the function of both hemispheres of the brain, which then affects aesthetic development. This is in line with Edwards' study (1999), which reported that a person understands and recognizes beauty and different forms of art in different ways, because of his experience and ability to remember and understand the concept of beauty.

Visual Thinking Strategies (VTS) is one method for developing aesthetic skills. Another technique is Aesthetic Thinking, developed by DeSantis and Housen (2000), which categorizes processes into five stages: the accountive, constructive, classifying, interpretative, and re-creative. Housen (2007) used this technique with individual learners, through speaking, thinking, providing information, and written records of their observations about a piece of art, and their expressions about what they had learned. This is in line with Parson's concept of cognitive development of the aesthetic experience (1987), which categorizes the aesthetic concept into five stages, which are favoritism, idea of subject, expression, formal properties, and judgment, which, it has been shown, can be trained. Patterson (2015), however, claimed that doing drawings from observation (e.g. blind contour, contour, shape, perspective, value, or texture) prompted learners to be more attentive, as they had to look at the model while drawing. This helps develop their consciousness, observation, thinking, and drawing skills.

In addition, Gibbs (1988) mentions that the reflecting cycle consists of description, feelings, evaluation, analysis, conclusion, and making action plans. Some of these are in line with Johns (2013), with regard to the reflections related to aesthetic development, which were 1) description of experience, 2) reflection, 3) influencing factors, 4) could I have dealt with it better, and 5) learning personal ethics and aesthetics. This aesthetic reflection corresponds to the concept of contemplative art, which combines different art activities with the devel-

opment of experience in contemplating a certain thing, to reflect the thoughts and feelings of a person. These bring about hidden potential through artistic work, using the Buddhist concept of "Bhavana Four," or the four developments, which are: 1) physical development, 2) emotional development, 3) moral development, and 4) intellectual development.

The development of both brain hemispheres is achieved when one looks at a picture and thinks, as is done with various art activities. Neuroplasticity is enhanced when one coordinates the use of the neural visual pathway, the central nervous system, and the hand and finger muscles, to create various works of art. Such activities prompt the elderly to express their thoughts, mood, and spatial imagination. Moreover, they help them explore their own mood and thoughts, and relieve stress, which are important factors for aesthetics development in the elderly, and which also lead to pride in themselves and discovery of their other potential.

This pilot study was aimed at developing an art group activities program to improve the aesthetics, cognitive function, mood, and quality of life of those elderly who were diagnosed with MCI in the outpatient setting of King Chulalongkorn Memorial Hospital, and which would then be implemented later as a treatment program, as part of the regular, routine services in the hospital.

Methods

Participants

The study protocol was approved by the Committee on Human Rights Related to Research Involving Human Subjects, based on the Declaration of Helsinki, and was performed at the Department of Psychiatry, Faculty of Medicine, Chulalongkorn University. This study recruited 30 elderly participants from King Chulalongkorn Memorial Hospital between January to August 2019. Their average age was 71 years and 4 months old (6.28%). They were screened using the Thai Mental State Examination (TMSE) and Montreal Cognitive Assessment (MoCA). Inclusion Criteria were 1) men and women, 55 years old, 2) diagnosed by a psychiatrist or neurologist with MCI, 3) MoCA score > 23, 4) able to travel back and forth on one's own, 5) understand, read, and write in Thai, 6) willing to join the research program, and able to participate in all activities over the full six weeks.

Research Instruments

Quantitative data were collected with a questionnaire concerning the participants' demographic and clinical information. The main outcome was assessed by using The Thai Geriatric Depression Scale (TGDS) for depressed mood, the Montreal Cognitive Assessment (MoCA) for cognitive function, and the World Health Organization Quality of Life (WHO-QOL) Brief for quality of life. The Aesthetic Assessment scale was used to rate the aesthetic skills learned during the experiment. The qualitative data were collected from six art activity plans, and qualitative interviews were also held, which were validated in terms of content, language, content coverage, clear questions, and objectives congruence. The results of the Index of Item-Objective Congruence (IOC) of the activity plans were at 1 at the maximum, followed by 0.8 and 0.6, respectively. The statistical analysis of the quantitative data was performed using STATA, version 15.0. The qualitative data were analyzed using content analysis.

Preparation for Arts-Based Interventions

After informed consent by all participants, a baseline assessment was performed for all subjects, who were then randomly assigned into either the control group or the experimental group, consecutively.

This pilot study took place from January to August 2019. Each group activity, whether of the control group or the experimental group, consisted of five participants. Each participant was required to attend three study periods in order to accomplish the pilot study. Upon completion of the six weeks of art activity sessions, a post-test assessment was given. The Thai GDS, MoCA and WHOQOL were used by trained clinical psychologists to evaluate mood, cognitive status, and quality of life, initially at the recruitment period, and then again after six weeks of study (Figure 1).

<table>
<tr><td colspan="8">Participant & Screening (N=30)</td></tr>
<tr><td colspan="8">Pre-test (N=30)</td></tr>
<tr><td colspan="2">Control group (N=15)</td><td colspan="6">Intervention group (N=15)</td></tr>
<tr><td colspan="2">Health education about MCI 60 mins.</td><td>A1</td><td>A2</td><td>A3</td><td>A4</td><td>A5</td><td>A6</td></tr>
<tr><td colspan="8">Post-test (N=30)</td></tr>
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Figure 1. Overview of methodology.

Program Design and Implementation

The 15 subjects in the control group received the standard of care from the attending physicians, plus one group health education session on the topic of MCI, which lasted 60 minutes. The 15 subjects from the experimental group, on the other hand, attended weekly art group activities continuously for 6 weeks (hereafter referred to as A1-A6), which were conducted by the researcher. The art activity program to develop aesthetics in the elderly with mild cognitive impairment consisted of the six art activity plans. Each plan lasted 60 minutes. There were four stages, as a cycle, in each activity (Figure 2), which were:

1. Mental images,
2. the main activity, which was divided into two parts:
    a) Visual thinking, focusing on using eyesight, and
    b) expressing opinions of an artwork by answering three main questions, which were:
        i. What happened in the picture,
        ii.What made them think it corresponded to what they said, and
        iii.What else they saw in the picture
3. Reflection, and
4. a reflective sketchbook journal.

The art activities for the experimental group consisted of six activities, A1-A6, which were:

A1. “Chan Chan Chan,” a contour drawing of their own faces.
A2. “Sensai Suesan,” listening to a song and drawing lines from imagination, and coloring a blank space.

A3. "Pan Pan Hansa," molding a sculpture from their imagination.
A4. "Miti Sangsan," designing a two- or three-dimensional artwork from waste materials.
A5. "Phanphang Kanduenthang," creating a simple map.
A6. "Chuek Ruamjai Saiyai Thankthor," working together with natural materials to create an artwork for the public, community, and society (Figure 2).

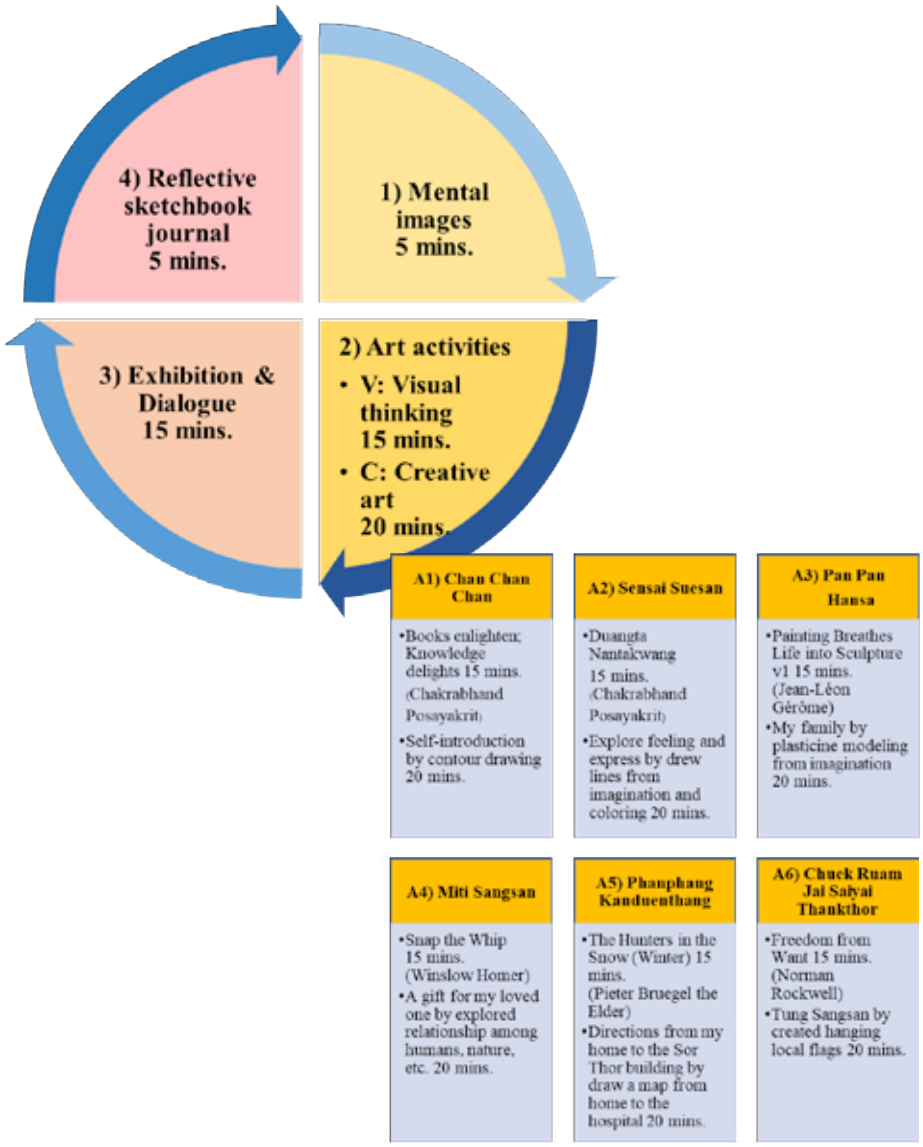

Figure 2. Structure of Arts-Based Program for Quality of Life & Cognition.

Six famous (i.e. highly recognizable) paintings were employed in the study: 'Books Enlighten; Knowledge Delights', by Chakrabhand Posayakrit; 'Duangta Nantakwang,' by Chakrabhand Posayakrit; 'Painting Breathes Life into Sculpture, v.1,' by Jean-Léon Gérôme; 'Snap the Whip,' by Winslow Homer, and 'The Hunters in the Snow (Winter),' by Pieter Bruegel (the

Elder). Each activity plan (i.e., A1 to A6) combined the four stages. The cycle began by working with one of the famous paintings as the springboard, then visual thinking, focusing on using the eyesight, and finally expressing opinions of an artwork by answering the three main questions, e.g. line, dimension, contour, etc. Finally, the task was to make one's own art production, emulating the various criteria that were studied in the original springboard painting, such as line, dimension, or space, etc.

Results and Discussion

The quantitative and qualitative analysis of the implementation is as follows:

Background Characteristics and Context

The baseline results from the MoCA and Thai Geriatric Depression Scale (TGDS) showed that both the control and experimental groups had cognitive impairments. There were problems generally related to concentration and memory, which included forgetfulness, wrong working steps, inefficient planning, bad concentration, slow thinking, forgetting words, getting lost, and confusion of directions. The other problems related to depression included losing interest in what they used to like doing, having no concentration, an inability to come up with ideas, tiredness, lack of energy, and feeling worthless and guilty. However, there were no participants with any desire to die or commit suicide. In addition, there were no relatives or family members with Alzheimer's or mental illness.

All participants' educational level was recorded. Nine of the participants (30%) had graduated with a bachelor's degree. Six participants had graduated at the primary school level, and another six participants had graduated from high school or with a vocational certificate (20%), The final two participants had graduated from secondary school (6.67%).

The participants' financial means and resources were noted. Sixteen participants used to have a job (53.33%). Four used to be businesspeople or vendors (13.33%). Twenty-two participants had an income (73.33%). Of these, 17 had adequate income and savings (56.67%), whereas two participants did not have enough income (6.67%).

The participants' state of health was noted. Thirteen had hyperlipidemia (43.33%), followed by 12 with high blood pressure (40%). One participant each had thyroid, allergy, hepatitis B, or bone disease (3.33%). No participant was a drug user (Figure 3).

Characteristics	Art (n=15)	Control (n=15)	P-value
Age (years)*	69.47 (6.98)	73.33 (5.01)	0.092
Female	15 (100)	10 (66.67)	0.042***
Married vs. others (single, separated, divorce, widow)	8 (53.33)	10 (66.67)	0.456
High level education (more than high school)	7 (46.67)	9 (60.00)	0.464

Figure 3. Table of Baseline Characteristics and MoCA Scores. ***Fischer's exact. Continued on the next page.

Characteristics	Art (n=15)	Control (n=15)	P-value
Currently working	2 (13.33)	4 (28.57)	0.390***
Having Income	12 (80.0)	10 (66.67)	0.409
Living in Bangkok	13 (86.67)	10 (66.67)	0.39***
Having a caregiver	4 (26.67)	3 (20.00)	0.5***
hypertension	5 (33.33)	7 (46.67)	0.456
DM	4 (26.67)	3 (20.00)	0.5***
DLP	5 (33.33)	8 (53.33)	0.269
Heart	1 (6.67)	1 (6.67)	0.759***
CA breast	2 (13.33)	0 (0)	0.241***
Drug abuse	0 (0)	0 (0)	NA
MCI	15 (100)	15 (100)	NA
inattention	8 (53.33)	11 (73.33)	0.450***
Poor memory	8 (53.33)	7 (46.67)	0.715
disorganized	1 (6.67)	1 (6.67)	0.759***
poor concentration	2 (13.33)	4 (26.67)	0.326***
Slow of thought	4 (26.67)	7 (46.67)	0.225***
Word finding problems	6 (40.00)	9 (60.00)	0.273
miss direction	2 (13.33)	1 (6.67)	0.5***
depression	15 (100)	15 (100)	NA
feeling sad	0 (0)	1 (6.67)	0.5***
loss of interest	1 (6.67)	1 (6.67)	0.759***
poor attention	4 (26.67)	2 (13.33)	0.326***
Low energy	1 (6.67)	2 (13.33)	0.5***
appetite change	3 (20.00)	0 (0)	0.112***
sleep disturbance	4 (26.67)	3 (20.00)	0.5***
agitation	1 (6.67)	2 (13.33)	0.5***
feeling worthless	1 (6.67)	1 (6.67)	0.759***
thinking of death	0 (0)	0 (0)	NA
family history of dementia	0 (0)	0 (0)	NA

Figure 3. Cont. Table of Baseline Characteristics and MoCA Scores. *Mean (S.D.), Student T-test, **Median (range), ***Fischer's exact & ****Wilcoxon sign rank test.

From the analysis of the six art activities, it was found that the participants observed and expressed their opinions about the content of a picture, its beauty, mood, ideas, feelings, and other aspects of aesthetics.

The analysis was concluded and presented in three parts, as follows:

Visualization

All participants were asked to give a detailed description and observation of an artwork, by describing a picture, and answering three main questions, which were:

1. What happened in the picture,
2. What makes you think it corresponds to what you said, and
3. What else do you see in the picture?

Most participants had no prior experience in visualizing, or in thinking and speaking about what they saw in a picture. Therefore, during the first period, they were not confident in sharing their opinions. In the first stage, most of the participants merely looked at the picture, and simply explained its story and obvious content, rather than observing its technical details, such as drawing technique, color choice, or other techniques related to art creation.

However, from the third stage onwards, they began to express more opinions about the content, story, and details of what they saw in the picture. This was evidenced by what they shared. Good examples can be found in A3 “Pan Pan Hansa," from the picture, ‘Painting Breathes Life into Sculpture, v. 1,' and in A5 “Phanphang Kanduenthang," from the picture, ‘The Hunters in the Snow (Winter),' and in A6 “Chuek Ruamjai Saiyai Thankthor," from the picture, ‘Freedom from Want’.

Aesthetic Inquiry

The participants were eager to join the program, and think about art activities which were related to observing a picture. Most of them had no previous experience with artwork. They were, therefore, interested and enthusiastic, yet doubtful about their abilities to create such work. However, having been assigned a topic, they were able to work with interesting prominent features (See Figures 4, 5, and 6.).

Figure 4. A3 Inthanin’s work.

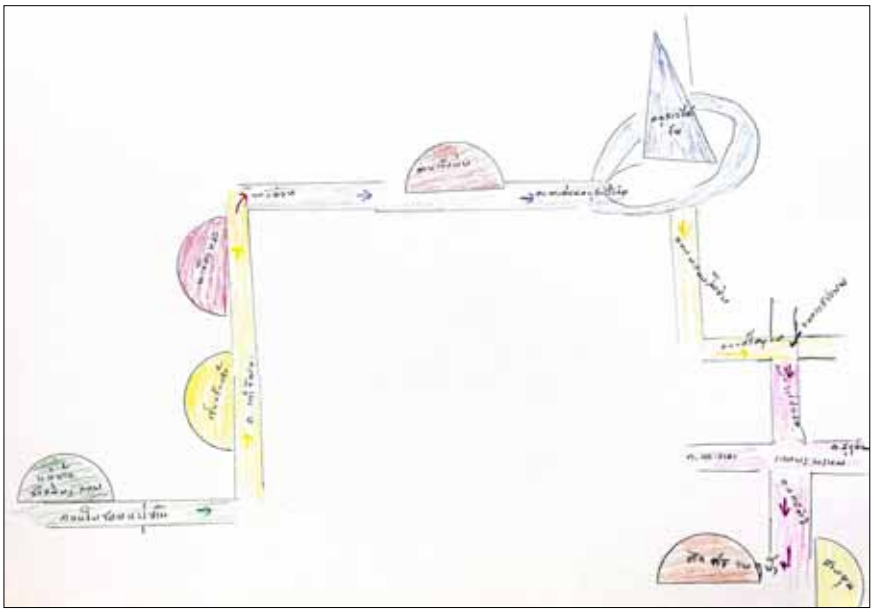

Figure 5. A5 Saiyud's work.

Figure 6. A6 group 2's work.

Figures 4, 5 and 6 show the participants' work, and their determination to complete an artwork. Although they did not have any experience in doing any of the kinds of artwork in any of the six activities, they showed some progress as they completed each new activity, and demonstrated an ability to finish the work, both individually and in groups, within the time.

Reflective Thinking and Expression

In their reflective sketchbook journals, most participants wrote that they had no experience of the six activities, whether in terms of observing, or thinking about art, or other related artwork experience. Some of them had had prior experience as children, but they

were not sure whether they could complete the assigned work now. However, once they started doing the activities, and found that they could do them based on their own ability, they were happy, and proud of their created work pieces.

In A6, "Chuek Ruamjai Saiyai Thankthor," which was working together with natural materials to create an artwork for the public, community, and society, the participants gave presentations of their works to the group.

> "… There are many colors in my work. The work needs help from everyone. Each person does their own work and combines their work with others. This means it needs cooperation and unity to complete a Tung. Whether it is beautiful or not is up to each one of us. Our work may not be as beautiful as the common Tungs, but everyone is determined, cooperating, and united to make this beautiful Tung…" (Khem)

(Tung are flags in the northern Thai style, and are mainly used to celebrate auspicious events in Buddhism, such as weddings. Various materials, shapes, and sizes are seen, and they include various details in the designs).

Some participants used their reflection on their own work, mood, and other feelings as information for creating new works of art.

Cognitive and Quality of Life Results

There were no significant differences in the baseline MoCA scores or QoL scores between the control group and the experimental group at the outset. Participants in the art activity group ultimately showed higher improvement of MoCA than the control group, with a statistically significant ($P < 0.05$). Letter fluency and delayed recall showed greater significance than other cognitive domains ($P < 0.05$). Figure 7 shows the baseline MoCA scores. The detail of the other cognitive domain scores can be seen in Figure 7, Figure 8 and Figure 9.

	Art (n=15)			Control (n=15)		
	Pre	Post	P-value	Pre	Post	P-value
MoCA (visuospatial/executive)	3.6 (1.24)	3.5 (1.60)	0.818	3.2 (1.37)	3.7 (1.45)	0.169
MoCA (naming) 3 animals	2.7 (0.59)	2.7 (0.72)	0.334	2.8 (0.56)	2.9 (0.35)	0.334
MoCA (attention) 1 digit forward/backward	1.9 (0.35)	1.8 (0.56)	0.67	1.7 (0.59)	1.9 (0.35)	0.499
MoCA (attention) 2 vigilance	1 (0.38)	0.9 (0.26)	0.582	1 (0.53)	1 (0)	1
MoCA (attention) 3 serial 7s	2.5 (0.92)	2.4 (1.18)	0.792	2.4 (0.83)	2.5 (0.70)	0.7179
MoCA (language) 1 repetition	1.1 (0.70)	1.1 (0.70)	1	1 (0.65)	1 (0.65)	1
MoCA(language) 2 letter fluency	0.4 (0.51)	0.7 (0.49)	0.041	0.3 (0.46)	0.5 (0.52)	0.271
MoCA (abstraction)	0.5 (0.64)	0.7 (0.82)	0.384	1.1 (0.88)	1.1 (0.92)	0.774
MoCA (delayed recall)	1.3 (1.18)	3.3 (1.63)	0.001	1.7 (1.54)	3.1 (1.53)	0.011
MoCA (orientation)	5.6 (0.74)	5.7 (0.62)	0.582	5.7 (0.62)	5.7 (0.59)	0.751
MoCA score (Total)	20.7 (3.99)	23 (4.41)	0.01	20.9 (2.84)	23.3 (4.62)	0.012

Figure 7. Table of baseline characteristics of both art activity and control groups.

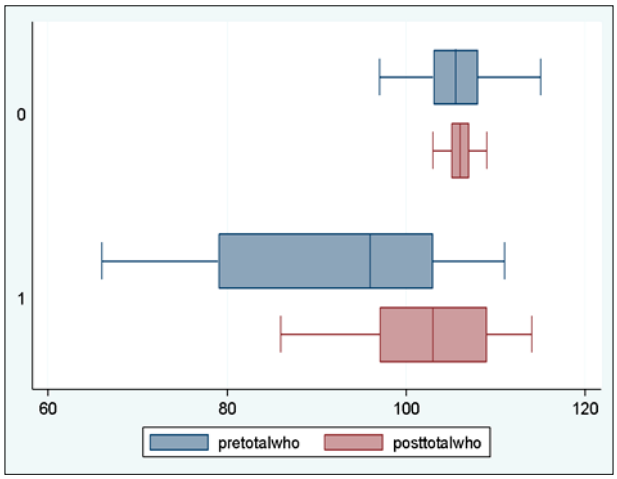

Figure 8. WHOQOL of both art activity and control groups (Pre Total WHO - Green, Post Total WHO Red).

The WHOQOL questionnaire was evaluated initially at baseline, and then again six weeks apart. The scores indicated significant improvement in quality of life for the participants who engaged in the art activities, as compared to the control group (P<0.05). Significant differences in the mean scores were observed in the physical health, psychological health, and environmental domains (P<0.05). (See Figure 9)

	Art (n=15)			Control (n=15)		
	Pre	Post	P-value	Pre	Post	P-value
WHOQOL	91.7 (13.11)	102.4 (8.38)	0.001	104.2 (6.69)	104.2 (5.97)	1

Figure 9. WHOQOL between art and control groups.

Dialogue from MCI Participants

In each activity, the participants had a chance to explore, observe, and reflect on their own thoughts, feelings, work process, artwork, and other requirements, etc. At the end of the program, the cognitive skills of the participants in the experimental group were significantly higher than those in the control group, p = 0.012.

This corresponds to the feedback from the interviews, in which participants said that they liked all the activities, as they were good and appropriate.

There was a variety of activities, including listening, thinking, and speaking activities, done both as individual and group work. These made them proud of themselves, as was claimed by Khem and Wassana, who said that *"… the art program is appropriate … We did what we had never done before. We try our best, whether it comes out beautiful or not, but we are proud of ourselves …."*

The findings suggest that the experimental group's cognitive MoCA scores were significantly higher, p = 0.01. This is in line with the research findings, which showed that activity A5) "Phanphang Kanduenthang," which was creating a simple map, helped train the

participants' concentration, and also helped them reflect and recall their daily routine of traveling from their homes to the research location. The participant, Mali, confirmed that *"… I really like this activity, because I feel that my thinking skills and brain are developed. I also gain new knowledge…."*

The Prasat Neurological Institute of the Department of Medical Services (2014) reported that reminiscence therapy, or the training of perception and interaction with different aspects of making art or other activities, can stimulate memory and mood. This can be done by encouraging a person to recall his past experience, or a particular event. This is conducted through different forms of media that are related to a person's memories. Thus, activity A5) "Phanphang Kanduenthang," the map activity, was a task to exercise their thinking and creativity, based on their past experiences.

Moreover, the activity helped the participants develop their visuospatial skills. The MoCA scores of the experimental group had significantly improved after the activity, at the level of 0.01, which supports what Pipitthanaban et al. (n.d.) and Sittironnarit (2011) suggested about prevention and treatment guidelines for patients with different levels of cognitive impairment. They indicated that there should be activities that enable the elderly to recall their past behaviors. Organizing activities that recall past behaviors will help the elderly practice thinking. Reflecting on oneself in everyday life also develops skills related to cognition, because this is training in thinking about original experiences, thinking in chronological order, and so on. This is easy to achieve in daily life, which Farran and Formby (2012) referred to as the ability to perceive and interact with what is related to eyesight, or to complete activities that require daily life skills. Such activities are also a method to promote visuospatial perception. They have to do with the ability to perceive and interact with things that relate to vision or touch. The various experiences that require daily skills are consistent with encouraging Alzheimer's patients, and understanding and using symbols. By visiting museums and displaying maps or images of various symbols, patients cultivate their visuospatial perception (The Museum of Modern Art, 2016).

The findings of the aesthetic self-assessment also indicated that the program helped promote better mood, calmness, relaxation, and confidence ($p = 0.083$). This was supported by the participant, Nonsri, who reflected that *"… before the program, I felt pressured from different things. I saw things negatively. After the program, I feel that there are still ways for the emotion to be drawn out and see things more positively. The activity makes me feel relaxed with what I find stressful, so I feel less stressed …" Likewise, Wassana noted that "… mood, aesthetics, and thinking are better … It is like the activity prompted me think, and makes me feel happy and have more imagination …"*

This supports Havsteen-Franklin and Altamirano's study (2015), which showed that different forms of art affect mood and the mind development process. This can lead to various psychological changes, which support clinical treatment. In the present study, it was found that, after the program, the sad mood scores of both the experimental and control groups were lower (Art, $p= 0.304$; Control, $p= 0.769$). However, the depression test scores between the two groups were not significantly different. This might be due to the short duration of the present study, and to the fact that there is no record of depression prior to the program.

Nevertheless, some participants stated that this program helped elevate their mood, calmness, relaxation, and confidence. They reported that they felt relaxed, as they were able to vent their thoughts and feelings through the artwork. Nonsi said, *"…Before studying, I felt that there was a lot of pressure and pressure on many things, and I looked at things very negatively. The activities we do make us feel more relaxed about the things we stressed before, making it less stressful…."*

And, as Saiyud said, *"…going to work is happier. Happy to go to the gym, work, socialize, chat with friends around the environment, the atmosphere is good, most of them cause positive thinking…"*

They also had a chance to try new things, which boosted their happiness and creativity. As Vasana said, *" Emotions, aesthetics, and thoughts will be better after learning… just like doing activities. This will make you happier and more imaginative."*

Moreover, this study gave evidence of improvement in communication between the brain hemispheres and hand-eye coordination. When completing the work, the participants needed to be mindful, concentrate, and focus on hand-eye coordination. The use of thinking skills, hands-on experience, and creating their own work utilized both the left and right brain hemispheres. This supports Edwards' study (1999), which claims that to complete an artwork, collaboration between the two hemispheres is needed, and this enables the participants' perception of visuospatial skills, feelings, structure, and patterns. The use of art in clinical treatment, which is related to the development of determination and satisfaction, helps develop the nervous system, social skills, and self-confidence (Chancellor, et al., 2014).

The findings of this study also suggested that the experimental group had significantly higher levels of aesthetics, cognition, and quality of life than the control group, $p = 0.001$, 0.01, and 0.012. This is in line with Heilman and Acosta's study (2013), which reported that doing artwork affects an individual's brain and quality of life. Completing an artwork is related to the use of the right brain hemisphere, which is connected to doing the work, as well as to the understanding of a pictograph. Therefore, doing an artwork can improve the brain, and the development of a person's quality of life, since art work is related to the use of the right hemisphere, which is linked to working with and understanding artistic visual language. Therefore, working with art promotes the link between neuroscience and art, while the ability to perceive, and the interaction between the eyesight and the motions necessary to completing an activity that is related to daily life skills, are enhanced (Farran & Formby, 2012).

In addition, the feedback from A6) "Chuek Ruamjai Saiyai Thankthor," which was working together with natural materials to create an artwork for the public, community, and society, showed that most participants liked this activity, as it gave them the opportunity to design their own section, and integrate it as a part of the group design as a whole, under the topic "Tung Sang San," which was to create flags in the northern style. As this activity required collaboration, it brought unity. Many participants reported enjoying and liking it the most.

In the reflective journal, Angkarb said that *"… this gives us the opportunity to unite and collaborate. I really like it …"*

Lamduan asserted that "*… after looking at the picture and explaining … I could use my brain and use it to bind the Tung. We use our brains to collaborate … that makes me know my brain is still working …*"

In general, both the individual projects and the group work encouraged the participants to use various skills, including socializing, listening, thinking, speaking, and group presentation skills. This matches the treatment guidelines from Prasat Neurological Institute, Department of Medical Services (2014), which specializes in curing patients using different types of treatments and healing modalities.

The "Tung Sang San" (flag) activity also helped train cognition-oriented skills, both individually and in groups. It focused on stimulation-oriented skills, using recreation therapy through working with art, which helped stimulate cognition and understanding of their new roles and responsibilities, and developed their self-reliance, as they designed their individual Tung. They then had to change roles, from being self-reliant to being members of a group, when creating the group's Tung.

The difficulty in creating the group Tung was in the assembly of the individual Tungs to form one group Tung, such that it could be hung or presented as one piece. The idea that this type of activity can develop both hemispheres of the brain (when one is in the process of learning about aesthetics) corresponds with Edwards' concept (1999), which explained that observation affects decision-making and visuospatial understanding of different types of relationships, and how to carry on with the task. The right hemisphere is responsible for understanding feelings, the ability to observe overall images, and the perception of related patterns and structure.

This concept is in line with the concept of the development of aesthetic thinking by DeSantis and Housen (2000), who suggested that looking at a picture and thinking about it is an activity that can encourage further thinking skills. This was supported by the results of the present study, in that most participants had significantly higher scores on aesthetics, $p = 0.001$. It corresponded, for example, with the self-evaluation on aesthetics of the participant, Wassana, as she described that "*… mood, aesthetics, and ideas were better after the program. This is because, before the program, I never looked at a picture and thought. After learning, I look at a picture and think more. When I join the activity … It makes me think and be happy, and have more imagination. For thinking, when we look at a picture, we think and think of how to draw and it makes us be more careful …*"

Angkarb also said that "*… aesthetics before the program … is at intermediate level … after the program, it has improved …*"

Similarly, Inthanin evaluated herself, writing "*… before the program, I would give two points for my aesthetics, but I give myself a four after the program, because I did not know how to draw before that … my works are colorless. I did not know how to use colors. After the course, I know how to do artwork, how to choose and use colors …*"

Chamchuri evaluated herself in the same way, by recording "*… in the past, I liked to think and speak out right away. After the program, I think before speaking … about aesthetics, I would give myself three points before the program and four points after the program; for example, I am more detailed, especially on behaviors like funny, strange, or on colors …*"

In Khajorn's self-evaluation, she concluded that "*… I give myself three points before the program, as I was sometimes moody, but, after learning, I understand and try to adjust myself, so I would give myself four points … about aesthetics, before the program, I give myself three points, and, after the program, four points, as I feel more enjoyable about thinking. My scores are four before and five after the program. My ideas are better after listening to what the instructors explain … I have the idea of doing better work … about quality of life, I give myself four points before and five points after the program, because it is better … I listen to the instructors … observe others …*"

In A1), the participants were asked to do a "self-introduction," by doing a kind of self-portrait, using blind contour. They needed to focus, as they had to look at the model (which was, of course, themselves), and draw from their feelings. This promoted observational skills, and the action of doing line drawings affected the development of thinking skills. Patterson (2015) found that blind contour, contour, shape, perspective, value, and texture are all aspects that require focusing, as the artist needs to look at the model, (which, in this case, was oneself), and draw from one's feelings. This helps train the consciousness, and develops observational and line-drawing skills, which also promotes the development of thinking skills, stable moods, and overall learning. Such improvements were strongly implied in the results of the present study, which show that the participants' MoCa scores were significantly higher than pre-test, $p = 0.01$.

The practice guidelines for dementia of the Prasat Neurological Institute of the Department of Medical Services (2014) suggest that doing crafts and artwork helps stimulate cognition in the elderly, and helps them to understand their new roles and responsibilities. Both art therapy and music therapy (including journal writing) can delay dementia. This study's art activity program helped the participants look at a picture and think, observe, analyze, criticize, imagine, and express mood and feelings, and then relate this to the creation of the various works of art in the six activities.

This allowed the experimental group to improve their aesthetics. For example, initially, in A1, the participants merely talked about the picture, and described the content in detail. There was no language related to art techniques, aesthetics, or their mood or imaginings, as they looked at the picture. However, by Activities 5 and 6, the participants were using more words related to aesthetics, and to details with regard to the beauty that they saw in the picture. There included explanations and comments on the use of colors, interjections, feelings, and expressions of mood, while they looked at the picture.

The self-evaluation of the participant, Inthanin, supported this: "*… before the program, I give two points for my aesthetics, but I give myself a four after the program, because I did not know how to draw before that … my works are colorless. I did not know how to use colors. After the course, I know how to do artwork, how to choose and use colors …*"

Looking at the picture and thinking actively not only improved observation, and confidence in thinking and speaking, it also boosted the participants' self-confidence and socializing skills.

Inthanin said that "*… to socialize and talk … I am more confident. In the past, I was not that confident … to stand, answer or talk … I was not confident at all … after learning with the instructors, I*

am more confident to stand up and express the picture. I never did this. I was not good at this. Now I am more confident … I think it is good … everything is good … before the program, I give myself just one point … after the program, my score is five …"

This supports Housen (2007), who suggested that the strategy of looking at a picture and thinking can encourage the thinking skills of everyone from every level, especially those with Alzheimer's. Likewise, Demarin et al. (2016), which was a study on experiential training and observation related to working in the arts, found that visuospatial perception of the damaged right hemisphere affects the left hemisphere, and affects the individual's creative responses to art and quality of life.

Conclusion

The design of this art activity program to develop the skills needed for handling dementia and quality of life of the elderly through collaboration, art education, and neurology was just the first phase of a proposed much longer project. The results of the present study indicate that the participants' cognition, aesthetics, and quality of life were quantitatively and qualitatively higher than before joining the program, and higher than those of the control group. Specifically, according to the qualitative data, the participants' art skills and aesthetics were improved. This was evidenced by their completion of all six activities. The higher quantitative and qualitative scores in the data analysis corresponded to the participants' self-evaluations that their cognition, perception, aesthetics, and quality of life all were better after the program.

However, due to such limitations as the number of participants and the short duration of the experiment, these results might be limited. The current research was also constrained by a lack of experience on the part of the researcher and the medical professionals who collaborated with the researcher on the project in conducting this particular type of study. The two sides were unfamiliar with one another's procedures and work processes, so the current study suffered from logistical inefficiencies.

Implications for the Future

Whereas art and medicine rarely meet, future researchers will want to make sure that they have good background training in, or exposure to, clinical medical practice, in order to collaborate with medical staff efficiently, and understand clinical procedures and work processes, and design the study with those in mind. Insofar as art can be considered soft power, it is further suggested that further research be conducted with integrated monitoring, with precise medical measurements of cognition, mood, and spatial imagination, throughout the progress of the six art activities in the program. The program should be designed for portable activity, so that it can be carried to a larger population, or made longer. Planning for additional time to be spent on ethics in research training, clinical research procedures, and medical-related documents is also encouraged. Increasing the duration of the program, and further development of aesthetics test scales, are also recommended. Finally, it is recommended that arts-based activities, based on the concept of transformative art learning, be designed to enhance not only cognition, but also emotion and motivation. The incorporation of transformative art learning into the program would give more promising results in different dimensions, and would be more beneficial for the elderly.

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