

Study on Color Art Therapy Techniques

An examination of techniques which allow elderly patients with severe dementia and motor impairment of the hands to express themselves to the same extent as healthy people

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Abstract: This research project is focused on art therapy techniques which can be used with patients suffering from severe dementia, and considers the extent of expressive ability patients can achieve through their use. Art therapy is one type of psychotherapy, and consists of a variety of different techniques, such as painting, 3-dimensional expression through sculpture, and miniature garden tending treatments. This type of therapy is used as a treatment for patients' with mental health problems, and as a way of analyzing patients' state of mind. There have been reports that use of art therapy can improve concentration in elderly dementia patients, and there is an increasing need for these treatments at geriatric care facilities. However, implementing art therapy for patients with severe dementia or hand motor control impairments is difficult, and these conditions often result in limitations of the patients' self-expression. In cooperation with the psychotherapy department at The A Hospital, a Japanese facility where elderly dementia patients receive long-term care, this study observed the progress of art therapy treatments in order to clarify their contents, and confirmed the effectiveness of the use of color tile arrangement for expressing abstract themes, a specific method used to enable patients to express their feelings in spite of their dementia. In addition, a comparison of the artworks created by these elderly dementia patients with samples created by healthy people in their 20s showed that this therapy technique enables an equivalent diversity and individuality of expression in both groups.

Keywords: Psychotherapy, Art Therapy, Dementia, Impairment, Elderly

1. BACKGROUND INFORMATION: EFFECTIVENESS OF ART THERAPY AND APPLICATIONS FOR TREATMENT OF ELDERLY PEOPLE

Art therapy was originally developed as a technique for treating mental illness, psychological trauma, and other mental problems, and was first used in the fields of psychiatry, psychology, and clinical psychology. In Japan, art therapy has made use of materials from a variety of fields, including painting, music, and classical Japanese poetry. According to Tokuda, although each of these techniques has its own individual theory and methodology, what they all have in common is that there is a process of art creation, and this art is then used to go beyond ordinary expository language to make it possible for individuals to directly express their current circumstances or mental state (Tokuda, 2011, pp.2-21). In this way, art therapy is typically conducted, by using artworks created in a variety of situations, to determine patients' mental states and analyze their condition, in order to understand their current status and prescribe the appropriate treatment (Imori, Nakamura, et al., 2011, pp.36-198). However, art therapy is currently being used for a wider variety of applications. In a nationwide survey of art therapists conducted in 2012 in Japan, the results showed that nearly the same number of therapists performed treatments on "people with no particular problems" as "people suffering from mental illnesses." In addition, more therapists responded that "change of mood / stress relief" and similar effects could be expected from treatment than things like "improvement of symptoms," and "problem resolution" (Kawata, Nishi, et al. 2012, p.9). New forms of art therapy with the objectives of "staring into one's own subconscious" and "self-healing" are being developed which individuals can perform on their own without the mediation of a specialist in art therapy (Yoshida, 2009 and 2005). In this way, art therapy is transforming from a technique for treating mental illness to a source of recreation, and is now being used as a means of achieving a variety of goals such as improvement of self-development and self-awareness. Also in the survey mentioned above, Kawata et al.(2012, p.28) stated that different types of art therapy can be broadly categorized into 4 groups: "psychotherapy," "self-development," "rehabilitation," and "expression."

Among these 4 groups, the focus of this study is the use of art therapy for "rehabilitation," which has been getting a lot of attention. Specifically, this is a use of art therapy for elderly patients suffering from dementia, and it is being implemented in a variety of locations in Japan, such as daycare centers, hospitals, and care facilities for the elderly (Nakagawa, 2001, pp.211-233), due to the aging population. Survey results have shown that the need for putting this type of art therapy into practice is the greatest in care facilities for the elderly (Kawata, Nishi, et al. 2012, p.9). Imai identified positive changes in the peripheral symptoms of dementia and emotional health of real-world patients after 12 art therapy sessions (Imai, 2006, pp.24-27), and introduced specific art therapy techniques which could be used by nurses, caregivers, and other medical personnel to achieve definite results (Imai, 2007). Also, Uno, Kaneko, Asada et al.(2004, pp4-9, pp84-85) used an extensive sample of art therapy patients' records to show that art therapy increased dementia patients' appetite, reduced their problematic activity, and improved their concentration. Patients with dementia index, CDR (Clinical Dementia Rating), scores ranging anywhere from 1 (slight dementia) – 3 (severe dementia), they were capable of taking part in art therapy sessions, and the report contains examples of works produced by these patients, as well as specific materials, tools, and coaching techniques used for the treatments. Regarding the reason why this art therapy improved the condition of dementia patients, Geijutsu Zokei Kenkyuujyo (2008,p.47), a sculpture research institute in Japan involved in the study of art therapy and its implementation suggested that the reason was the 4 healing properties of art: "the joy of using the 5 senses," "the absence of right and wrong," "the birth of communication," and "the praise received from people who saw a displayed finished work" . In addition, Ohashi et al.(2008,pp180-274) treated art therapy works as

clinical art, and pointed out that the goal of prevention and improvement of dementia can also be developed into an activity that contributes to society and regional welfare through art.

Building on the background detailed above, this research considers the specific techniques best used to conduct effective art therapy for elderly patients with dementia.

2. CURRENT STATUS AND CHALLENGES OF ART THERAPY FOR ELDERLY DEMENTIA PATIENTS, AS SEEN AT THE A HOSPITAL

In cooperation with The A Hospital, a facility for the long-term care of elderly dementia patients, this research was carried out as a case study of the institution. This hospital focuses special effort on treatments for the elderly, and it functions as a final resting place for many of its patients. With specialized psychotherapists taking a leading role, it offers a variety of psychological care for patients and their families. As part of this care, art therapy is administered at fixed intervals upon request, but there are a number of practical issues with art therapy conducted in this kind of busy clinical environment. Results of observation and interviews identified the following 3 issues as the main problems with art therapy administered at The A Hospital.

The first issue was participants' lack of ability to use the artistic tools provided. Many elderly dementia patients cannot skillfully perform tasks with pencils and scissors. According to clinical psychotherapists, elderly patients often get discouraged and feel that "I couldn't do it very well" when they have trouble with coloring and other such tasks and then compare their pieces with the work of other patients. Psychotherapists also said that the assistance of other people often has an effect on the finished products. There is a need for a technique which uses simple methodology to create pieces that freely express patients' individuality and psychological state while producing a finished piece that is a thing of beauty.

The second issue is that because patients cannot freely choose the materials used, this limits their expression. Sometimes patients just use whatever color happens to be close by (Figure 1).



Figure 1: Hand Drawings painted with a blue color pencil

This same phenomenon was observed in miniature garden treatments as well. The tending of miniature gardens is a traditional psychotherapy technique, and according to Nakagawa's report (2011, pp.313-324) it boosts patients' self-recovery ability, and can also induce recovery from mental problems, as shown through detailed recounting of real-world example cases. Although this therapy has been shown to be effective, observations showed that in some cases patients simply grabbed figures that were in easily reachable positions and placed them in the sand one by one without any particular purpose. When questioned about the meaning of their creations, they had no particular explanation (Figure 2).



Figure 2: Miniature Garden Therapy Compositions

This issue also occurred with collage (Figure 3), and the process of “take one piece of paper from the pile and glue it into place” was difficult for many patients. Some simply glued one piece of paper and then said they were finished. An environment and support structure that enables patients to freely choose from a variety of materials that are all easily within reach is needed.



Figure 3: Collage

The third issue was problems with cost, preservation, and storage. Many of the materials used for painting are expensive, and both the tools used and finished works can be quite bulky and cumbersome. Saito (2006, pp.55-58) identified this as a problematic area for elderly care facilities conducting art therapy.

3. GOALS OF THIS RESEARCH

Based on these problem areas above, the goal of this research project is to devise and confirm the effectiveness of a technique for art therapy that enables elderly patients with dementia and motor impairment of the hands or other areas to create artworks without feeling like they are “embarrassing and no good,” while at the same time expressing their mental state, memories, or other feelings. In addition to asking participants in the course of their therapy what they are trying to express with their artworks, pieces created through this technique will also be displayed to a third party, who will then be questioned about what kind of impression the works give them. Also, in order to resolve the issues of art storage and painting supply costs, various configuration possibilities such as using digital data to store works, reusing consumable materials many times so that there are no expenses for the hospital, implementing a system which can be used by 10 people simultaneously at different elderly care facilities and hospitals, enabling patients to work in individual hospital rooms and bedsides, and allowing patients to quit at any time and then continue their work on another day were considered.

4. ART THERAPY TECHNIQUES USING COLORS

4.1. Requirements for Techniques Using Colors

At this facility, there were existing restrictions concerning painting materials and treatment areas, and although art therapy using a large number of colors was not currently being performed, colors are often tied to memory and can be used for psychoanalysis for this reason, so the decision was made to implement art therapy techniques focused on the use of colors. Dee, Taylor, et al. (2006, pp.6-10) described how colors each have individual meanings, and can have an effect on behavior and state of mind, operating on both conscious and subconscious thought. Also, Suenaga (2001, pp.110-115) introduced color therapy techniques for the elderly which was shown to have effects such as improvement of patients' stimulation, expressive power, concentration, and memory, as well as contributing to a recovery of self-awareness.

Grounded in the current problem areas, this study considers color-based art therapy which fulfills the following 7 requirements.

- (1) Colors for expressing the patients' feelings can be chosen with a high level of freedom.
- (2) Motor impairment and dexterity do not affect the quality of the finished works.
- (3) Pieces show the individual personality differences of each participant.
- (4) Artwork can be converted to a digital format and reused in a variety of forms.
- (5) Creation of artwork is carried out by a simple process.
- (6) When certain operations are difficult for patients, assistance can be provided easily, and this leaves no "supporter fingerprints" on the completed piece.
- (7) The creation of artworks contributes to the original intentions of therapy, psychoanalysis and conversation with therapists.

4.2. 3 Techniques Considered for This Study

Because painting with many different colored paints would be difficult in a hospital setting, and colored pencils would be difficult to hold unassisted for some of the participants, the following 3 techniques for creating artwork using solid materials and color pieces were considered.

- (1) Reciprocal Division-and-Coloring Method: The therapist and patient take turns drawing lines on a sheet of white paper, then select a crayon to color in the areas partitioned off by these lines with. This method is recognized as a way to conduct psychoanalysis, and the procedures are simple, but the finished product is not a personal expression of the patient (Figure 4).

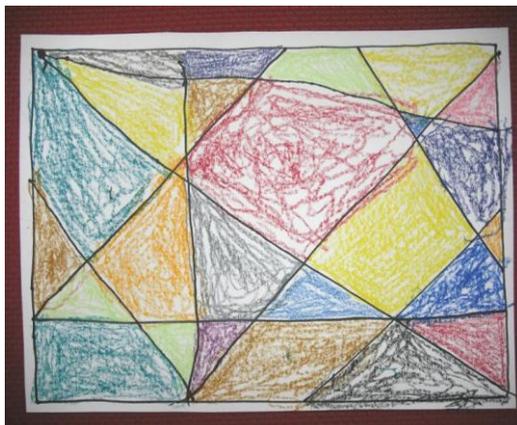


Figure 4: Finished Product from Alternate Color Partitioning

(2) Glued Paper Color Organization Method: 199 color scheme cards (Figure 5) pre-cut into small 10 millimeter squares to make colored paper pieces.



Figure 5: 199 Color Scheme Cards

These are then affixed to a white board with a weak adhesive applied to it to create a color configuration. (Sample created by a participant: Figure 6)

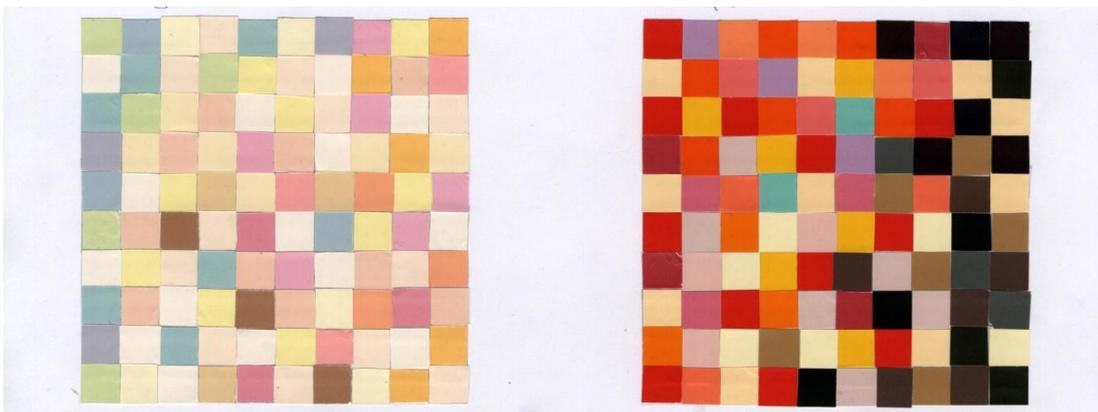


Figure 6: Color Configuration Using Color Scheme Cards (University Student) "Sweet"/"Spicy"

(3) Ceramic Color Tile (Figure 7) Color Configuration Method: 10 mm square tiles of many colors are lined up on one of 2 clear, square plastic plates with measurement markings (Figure 8) to create a color configuration. (Sample created by a participant: Figure 9)



Figure 7: Color Tiles

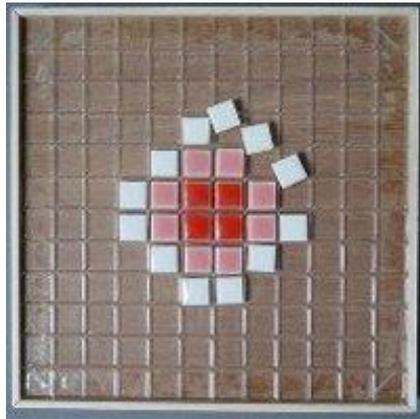


Figure 8: Plates for Lining Up Color Tiles



Figure 9: Color Configuration Using Color Tiles (University Student) "Hometown"

As a preliminary test of these 3 methods, elderly men and women in their 70s (2 of each gender) and men and women in their 20s (3 of each gender) were selected to participate in mock sessions. Based on these subjects interest in the tests, the ease with which they completed the operations, the time required for each, and their level of satisfaction with the pieces they created, the color tile method, (3), was selected to be used in this study. Several additional preliminary tests were then conducted using this method to consider the appropriate color selection, the type of tile storage system which would be easiest to use, the best way to support patients, and other issues.

5. EXPERIMENT PROCEDURE FOR CONDUCTING COLOR-BASED ART THERAPY AT THE A HOSPITAL “COLOR EXPRESSION USING TILES”

5.1. Tile Colors Used for the Experiment

Although there are 55 different colors of these tiles, this study classified them using the 11 simple color classifications of psychoanalysis. These are: 8 chromatic colors (red, orange, yellow, green, blue, purple, pink, brown), the neutral color, gray, and black and white. 3 shades of varying brightness for each chromatic color were used, along with 4 shades of gray and 1 tile each for black and white. These 30 tiles made up the total set for the experiment.

5.2. Tile Storage System Used for the Experiment

Based on the results of the preliminary experiments, an arrangement and storage system that would enable the subjects, in consideration of their motor impairment, to easily choose and take color tiles was implemented. Several compact plastic containers which allowed subjects to see the full range of colors at a glance were used (Figures 10 – 15). All of these containers were inexpensive articles.

A: 5 Cells * 6 Containers 30 Separate Colors (Figure 10)



Figure 10: 5 Cells * 6 Containers

B: 10 Cells * 3 Containers 30 Separate Colors (2 Sets) (Figure 11)



Figure 11: 10 Cells * 3 Containers

C: 14 Cells * 2 Containers 24 Separate Chromatic Colors + White + Black + 2 Light Gray Mixed Colors / 2 Dark Gray Mixed Colors (2 Sets) (Figure 12)



Figure 12: 14 Cells * 2 Containers

D: 10 Small Containers Similar Colors Mixed Together (Colors Mixed; Organized by Mental States) (Figure 13)



Figure 13: 10 Small Containers

E: 6 Large Containers (Organized by Color Phase Groups) (Figure 14)



Figure 14: 6 Large Containers

F: 3 Large Containers Warm Colors / Cold Colors / Neutral Colors (Figure 15)



Figure 15: 3 Large Containers

5.3. Experiment Themes

The task given to the subjects for this experiment was "Express your image of your favorite season using colors." Everyone has memories they associate with the seasons, and each season has specific scenery associated with it, events that take place during it, and various other connotations. As a result, a mental image of a season was considered relatively simple in spite of being an abstract concept. This is the reason for its selection.

5.4. Experiment Procedure

Sessions were conducted in a standard art therapy setting, with subjects sitting one by one at a C-shaped desk which stretched out horizontally to create their color configurations (Figure 16). Supporting staff sat in a position where they could easily provide the assistance required by each subject (Figure 17). This assistance mainly consisted of holding the color containers diagonally so that shorter subjects could see all of the colors (Figure 18), placing similar colors in the supporter's palms so they could easily choose from among them (Figure 19), and bringing the color containers to an easily reachable place (Figure 20).



Figure 16: The Therapy Room



Figure 17: Assisting Subjects with the Process



Figure 18: Placing Colors on a Diagonal So They Are All Visible



Figure 19: Color Selection By Pointing for Subjects with a Speech Impediment



Figure 20: Moving Color Containers to Positions Where Subjects Can Reach

Each participant was assigned one supporting staff member to observe and assist. While ensuring that all 30 colors were always within easy reach of the subject and providing assistance when necessary, these staff members also observed and recorded how easily each subject chose colors, grabbed the tiles, or instructed them to assist in doing so. A rotation of the different types of containers was used throughout the creative process in order to provide easy-to-use container systems for all subjects.

When the subjects' completed their configuration, staff asked each participant to explain what kind of intentions or ideas went into their color choices, and what they were trying to express. This information was also recorded. Subjects were also asked to give their pieces a title.

6. RESULTS OF COLOR TILE ART THERAPY EXPERIMENTS AND FURTHER CONSIDERATIONS

6.1. Subjects' Individual Characteristics and Working Environment

Ten subjects took part in the experiment, and 7 of these 10 were elderly people with dementia. Among these 7 were subjects who had poor motor control of the hands, tremors, inability to straighten their arms, difficulty seeing objects from far away, and other impediments. 4 of the subjects required assistance from support staff, such as taking the containers to them or showing them the tiles, but all subjects chose and placed tiles by themselves, regardless of how much time it took.

Even subjects with severe dementia, provided they did not have any motor impairments of the hands, were able to complete the process of placing tiles in all 144 cells within the 30 – 40 minute time period allotted. The 2 subjects who were unable to complete the task within this time period had speech

impediments and motor impairment in addition to their dementia, which caused communication to be time consuming, and as a result they were only able to complete placement of about half of the tiles. However, they were still able to focus on the task, and carefully choose and place each tile one by one, and continued to select tiles even after the working time had ended.

6.2. Comments from Participants Regarding the Intention of Their Pieces and Excerpts from the Data Recorded by Observing Staff

A-1 (Participant) Spring, The Color of May (Composition Title) (Figure 21)

Male. Slight dementia symptoms. Speaks slowly, but can handle ordinary conversation. Carefully selected tiles by himself, picked them up, and placed them.

Intention of Composition, Notes on Working Process:

Expressed the green of the trees of spring. Various colors of leaves (green), tree trunks, roots, and the ground (brown, pink, purple, etc.), the yellow light of the sun (filtering through the trees), white represented the space between the leaves of trees. Thought about memories of the many bonsai trees he kept in his home while working on the piece. Talked about how he liked bonsai trees and said "I used to have a lot of them at home" with a smile.



Figure 21: A-1:Spring, The Color of May

A-2 The Arrival of Fall (Figure 22)

Female. Slight dementia symptoms, but capable of conversation. Often says "I'm not good at drawing pictures." Chose and placed tiles independently.

Imagined autumn leaves and trees. Often sees leaves that appear black, so decided to use black tiles. Also added green and yellow ginkgo, brown leaves, and others. Put some blue in at the end because she hadn't used much of that color and wanted to try it. Said things like "the changing colors of fall are beautiful," "fall is all about autumn leaves," and "it's starting to look like the colors of fall" while working on it. After finishing, made statements like "my personality is a bit masculine, so that shows in the colors," "there's nothing feminine about it," and "I like clear and distinct colors like red and black. I'm a straight-forward kind of person."

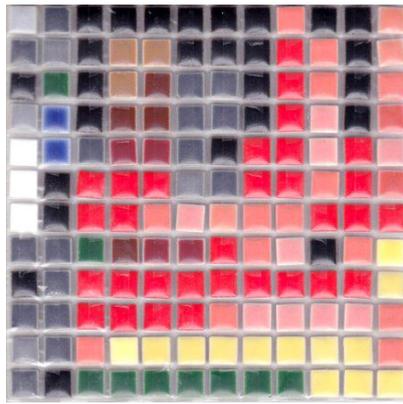


Figure 22: A-2:The Arrival of Fall

A-3 Spring Flowers (Figure 23)

Female. Dementia symptoms are becoming severe. Strong feelings of anxiety and fatigue, with poor concentration. Negative about herself. After staff brought the container she was able to choose and pick up tiles on her own, but placement took some time.

Imagined flowers such as tulips and hyacinths. Fixated on the depth of colors and their arrangement. Initially thought of fall, but changed to spring in the process of working on the piece. Looking at her finished work, said "I like this," and "It's nice and colorful."

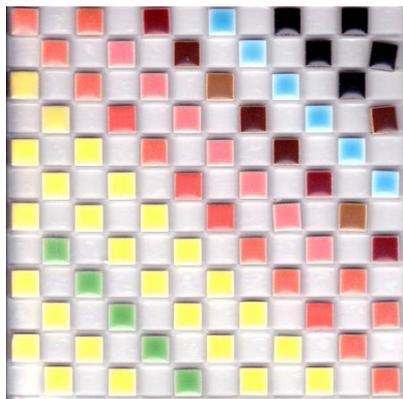


Figure 23: A-3:Spring Flowers

A-4 The Crisp End of Fall (Figure 24)

Female. Severe dementia, with difficulty speaking. Also suffers from vision impairment resulting from diabetes.

Her image of fall is leaves wilting and falling from trees, so she used brown. Also placed some purple, thinking it would stand out, which might be nice.

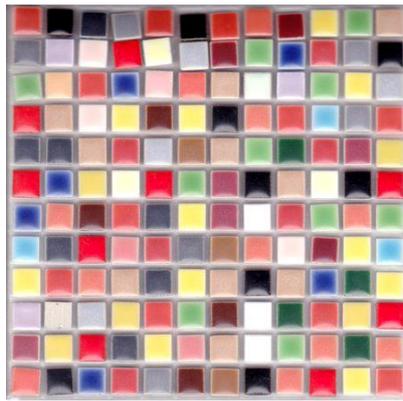


Figure 24: A-4:The Crisp End of Fall

A-5 Spring (Figure 25)

Female. Dementia symptoms present, but their extent is unclear. Difficulty having a conversation. Eyesight, hearing, and speaking ability are poor. No motor impairment of the hands. Placed the tiles promptly.

Couldn't express "spring" very well. She wanted to use more "deep blue" and "deep purple."

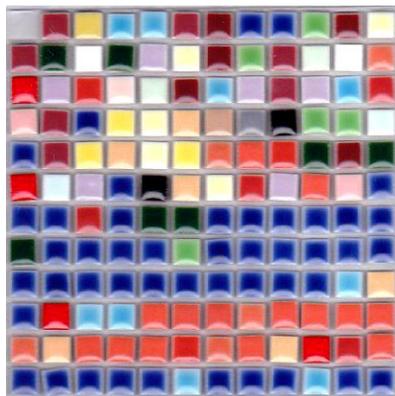


Figure 25: A-5:Spring

A-6 Fall (Figure 26)

Male. Slight dementia symptoms. Capable of conversation. Cannot extend his arms, and his hands shake. Although it is a very slow process, when support staff brought containers that are far away closer to him, he slowly selected tiles, thought carefully, and placed them on his own.

White stands for "daikon radish," and yellow is "mandarin orange." Also expressed a boundless blue sky. "It turned out a bit different from how I was thinking."

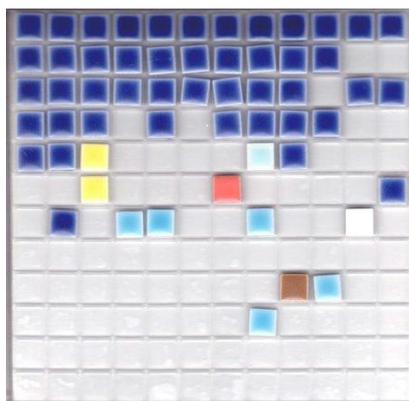


Figure 26: A-6:Fall

A-7 Summer (Figure 27)

Female. Dementia symptoms present, but their extent is unclear. Cannot carry out a conversation. Suffered motor impairment of the hands, and the process was extremely time-consuming. Very detail-oriented. Thought carefully before placing tiles.

Repeatedly said “the color of the sea.”

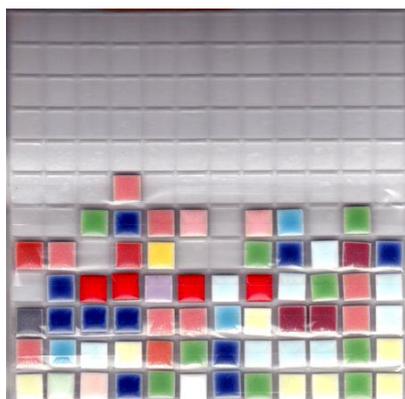


Figure 27: A-7:Summer

6.3. Considerations

Even in subjects with dementia, each was able to explain what they were trying to express related to the season theme of their choosing, and why they chose the colors that they did, although there was some variation in expressiveness. No piece was identical to any other (Figures 21-27), and these differences were not accidental, but reflections of the differing intentions, personal expression, and feeling of each participant. All subjects were given the same materials to choose from, and both selected materials and created their artworks independently. This means that these variations show the unique taste, artistic sense, and designs of each participant. Therefore, the goal of enabling each subject individual expression was achieved successfully.

For this therapy technique, support staff can do only 2 things: "have the subjects choose a color," and "place tiles in the position subjects indicate." Because there is no need for these staff members to produce anything, provided they can reach a mutual understanding, the finished works will be created completely by the subjects, although this may take some time.

Although there were some subjects who could not complete the procedures this time, they were able to

select colors they wanted to place on the boards, so if there were a compact color sample board available to help them confirm which colors they wanted support staff to pick up for them and come to a mutual understanding, the amount of time required for completing the color configuration would likely be shortened.

7. EVALUATION OF THE IMPRESSION EACH PIECE GIVES

7.1. Individual Evaluations of Each Piece

In order to check whether or not the goal of creating a system for art therapy which would not create any clear divide between "good" and "bad" works as a result of patients' experience with art, dexterity, and motor impairments of the hands, 5 pieces (B1-B5, Figures 28 -32) were also created by healthy adults in their 20s based on the same theme as described in 5.3.



Figure 28: B1:Spring Flower Garden



Figure 29: B2:Summer Seashore



Figure 30: B3:Autumn Leaves in the Mountain



Figure 31: B4:Summer Fireworks



Figure 32: B5:Flower Garden

A questionnaire format survey was then conducted regarding both the 5 completed pieces created by elderly dementia sufferers (A1-A5) and the 5 pieces created by healthy adults mentioned above (B1-B5). 97 men and women rated each of the 10 pieces (a 5 point linear scale system was used for evaluation on an absolute scale, and there were 91 valid responses). The works were shown one by one in a random order, and participants were asked to evaluate the four statements below as “strongly agree:1,” “agree:2,” “not sure:3,” “disagree:4,” or “strongly disagree:5.”

Question 1: This piece is beautiful.

Question 2: This piece is skillful.

Question 3: This piece is unique.

Question 4: This piece matches my image of the title.

7.2. Image Evaluations for Each Group

The 5 pieces from the elderly dementia sufferers group (Group A: A1 - A5, completed pieces) and the 5 pieces from the healthy adults group (Group B) were each shown to a total of 108 men and women in their 20s, and they were then asked to evaluate the statement "This group's artworks have a lot of variety in their designs" on the same 5-point scale used in 7.1.

7.3. Evaluation Results

Regarding the beauty of the pieces, comparing the differences in average evaluations between groups A and B showed that the B's average scores (2.22) were higher than A's (3.02) by .80, or approximately 5%, indicating a statistically significant difference ($t = 11.610$, $df = 455$, $p < 0.05$). Comparing the individual pieces, there was no significant difference between the evaluation of A-3 and B-2, B-3, or B-5 in terms of beauty, and A-3's evaluation was 1.14 points higher than B-4's. Also, there was no significant difference in the evaluations of A-4 and B-4.

For question 2's evaluation of the skillfulness of the pieces, the B group's average evaluation was 0.85 points higher, again a statistically significant difference. However, in individual comparisons, A-3's skillfulness evaluation was not significantly different from B-5's, and A-3 was rated 0.49 points higher on average than B-4. Also, there was no significant difference in the evaluations of A-4 and B-4.

Question 3's uniqueness evaluation was not significantly different between groups A and B. Comparisons of individual average scores also showed no major differences.

As for question 4, concerning whether or not each piece matched with the viewers' images of the title, the B group's evaluation average was 1.03 points higher, indicating a statistically significant difference. However, in individual comparisons, A-3's scores were not significantly different from the evaluations of B-3, B-4, or B-5, and A-1's scores were not significantly different from the evaluations of B-4. (Table 1 ,2)

In the evaluation of the variation in artworks of each group, A's rating was a statistically significant 0.77 points higher than B's. (Table 3)

Table 1: Average Scores for Each Piece: the elderly dementia sufferers group (n=91)

strongly agree:1, agree:2, not sure:3, disagree:4, strongly disagree:5	A1	A2	A3	A4	A5
1: This piece is beautiful.	3.352	3.220	2.077	3.011	3.418
2: This piece is skillful.	3.319	3.264	2.473	2.956	3.429
3: This piece is unique.	2.912	2.462	3.055	2.505	2.484
4: This piece matches the image of the title.	2.637	3.308	2.319	3.110	3.978

Table 2: Average Scores for Each Piece: the healthy adults group (n=91)

strongly agree:1, agree:2, not sure:3, disagree:4, strongly disagree:5	B1	B2	B3	B4	B5
1: This piece is beautiful.	1.604	1.934	2.154	3.220	2.176
2: This piece is skillful.	1.769	1.945	2.165	2.967	2.352
3: This piece is unique.	2.736	2.736	2.462	2.758	2.560
4: This piece matches the image of the title.	1.791	1.681	2.044	2.429	2.253

Table 3: Average Image Evaluation Scores for Variation Within Each Group(n=108)

strongly agree:1, agree:2, not sure:3, disagree:4, strongly disagree:5	Group A	Group B
This group's artworks have a lot of variety in their designs.	2.241	3.009

7.4. Image Evaluation Considerations

From the results of 7.3, although as a whole the image evaluations of the works produced through the experimental color-based art therapy method “color expression using tiles” at The A Hospital by healthy adults in their 20s were evaluated more highly than those produced by elderly dementia sufferers in terms of beauty, skillfulness, and matching the image with the title, individual comparisons showed that some of the works from the dementia sufferers group were evaluated equivalently and even more highly than some of the healthy adult group pieces in these categories. The fact that the healthy adults group used in this experiment, although they performed the same procedure as the elderly dementia sufferers group for creating artworks, was comprised entirely of people with an interest in color and design could have affected the results. In addition, because the evaluations were performed by a similar age group, they may have tended toward some of the same preferences, resulting in a bias. Forming a new control group of elderly people without dementia symptoms who have no particular interest in color and design to produce artworks which can be comparatively evaluated is required to clarify this point.

No significant difference was found in uniqueness between the two groups, and the variety of the compositions received a slightly higher evaluation in the elderly dementia sufferers group. This shows that using this technique gives participants room to express their unique individuality even if they suffer from dementia symptoms.

8. CONCLUSIONS AND CHALLENGES FOR THE FUTURE

In this experiment, the number of sample pieces in each group is small(5), so it should be necessary to pick up more samples and further testing is required to prove the result of the Image evaluation experiment. But the technique suggested in this research, "using colored tiles to create a color configuration representing an abstract concept," was successful in achieving the goal of "creating a specific art therapy system in which patients can express their individual senses without concern for whether they are skilled artists, regardless of whether they are suffering from dementia or not." Although support staff are required to assist patients who have motor impairments of the hands, it was clear that even in those cases these staff did not influence the complete works.

Also, the problems of storage and material costs were solved by making digitized copies of patients' art for safekeeping. As for reuse, there are actually plans to continue treatments with this technique and organize this saved data into a poster to be displayed in the hospital, and this plan was popular with many participants, their families, and hospital staff members. Some other ideas for using this data are also currently being considered, such as making postcards, displaying the images with a projector, and setting up an online exhibition.

Implementation for 10 subjects simultaneously was accomplished, but enabling the treatment to be used in hospital rooms and bedsides is a challenge for future studies. The materials used do not dry out or degrade, so treatment can be stopped and resumed at a later date without any problems, but some tool improvements such as a color sample board for use in helping patients communicate to support staff which color they want are necessary to ensure that patients can finish within the prescribed time limits.

At present, no psychoanalysis has been conducted using the finished works, but with the use of themes suited to psychoanalysis along with data regarding how conversation with the therapist progressed, the technique could be used for this purpose. Further testing is required to determine whether the goal of psychotherapy adaptability has been achieved.

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