

Effect Evaluation of Recreational Coloring Carried Out at Pay Nursing Home

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Abstract. Aging has becoming a serious problem to be solved in wide area of the world. In this study coloring was taking place at the pay nursing home for the aged tenant as part of the recreation, and the influence to the tenant was verified. It was suggested that the coloring showed effect to improvement s for reducing the frequency of wandering around and petition of excretion of the tenant. Coloring is easily done compared to painting and descriptions, also regardless to the needing care degree, more over a care worker's burden can also be reduced. As the result shows, coloring is suggested as an activity that should be taken as one of the recreations at the pay nursing home.

Keywords: key words Coloring recreation, Dementia, Nursing home.

1 Introduction

The population of the world is aging at an accelerated rate. It has becoming a serious problem in wide area of the world as shown in Figure 1. The number of elderly people are increasing for more than threefold since 1950, from approximately 130 million to 419 million in the year 2000. The number of elderly people is now increasing by 8 million per year, and by 2030, this increase will reach to 24 million per year. The most rapid acceleration in aging will occur after 2010, when the large post World War II baby boom cohorts begin to reach age of 65. Declining fertility rates combined with steady improvements in life expectancy over the latter half of the 20th century have produced dramatic growth in the world's elderly population. People aged 65 and over now comprise a greater share of the world's population than ever before, and this proportion will increase for more years.

As of October 1, 2010, the elderly population aged 65 and over became 29.6 million people to be the highest ever in Japan. Moreover the proportion of the population of the total population over the age of 65 was also recorded the highest of 23.1%.

When this tendency continues, one person in four people comes to enter the age of senior citizen in 2015.

The numbers of dementia patients are also increasing. Therefore, various measures for dementia prevention are taken place in many places. In Japan, transcribing a sutra is performed from ancient times for mental concentration, nevertheless there are difficulties for the aged person to transcribe a sutra because writing a Chinese character is very delicate work. Accordingly, coloring which is more easily carried out was paid to attention.

When starting coloring, people needs to observe the original picture carefully. At this time, lobus occipitalis that take charge of the sight work. Moreover, to understand the original picture accurately, the temporal lobe that takes charge of the memory works to refer from the memory the shape and the color sow in the past. The parietal lobe cooperates when the balance of the entire picture is gripped. As written above coloring has the effect to activate a widespread area of the brain. In this study coloring was taking place at the pay nursing home for the aged tenant as part of the recreation, and the influence given to the tenant was analyzed. As an early stage of this experiment we tried to verify the optimal writing equipment for coloring, which can give more effective influence to the brain activity during coloring.

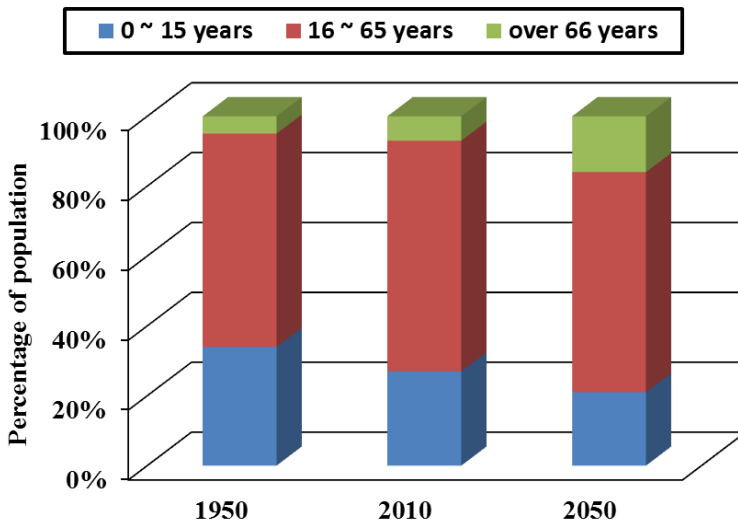


Fig. 1. Ratio transition of population in the whole world classified by generation

2 Experiment

2.1 Selection of Writing Instrument for Coloring Recreation

2.1.1 Change of Brain Activity by Difference of Writing Instruments

As an early stage of this study, experiment for effective evaluation to find the optimal writing instrument during coloring was carried out. The coloring experiment was

carried out with four kinds of writing instruments, such as crayon pastel (SAKURA COLOR PRODUCTS CORP), color pencil (MITUBISHI PENCIL CO., LTD.), felt-tipped pen (Too Corporation.), and color brush pen (soliton corporation CO. LTD.). Four writing instruments are shown in Figure 2. These four writing instruments are commonly used instruments for coloring. The brain activity in each case was measured.



Fig. 2. Four kinds of writing instruments for coloring

2.1.2 Experiment

Electroencephalograph of Digital Medic co.,Ltd, shown in Figure 3 was used to measure the brain activity. Five postgraduates cooperated in this experiment as a test subject. To make experimental conditions impartial, each test with different writing instrument was conducted in the same time zone of a different day using the same laboratory with a tranquil environment. The used sketch design of the picture is shown in Figure 4. The sequential order for coloring the grain of the grape was been determined to make equal condition between the subjects.

After having installed the electroencephalograph, test subject will close eye for 1 minute to record the brain wave at the rest situation, subsequently after that start coloring work for three minutes to record the brain wave during coloring. Assuming that the brain waves at the time of eye closure as 100%, the brain waves of alpha wave and beta wave under coloring work in progress was compared.



Fig. 3. Electroencephalograph of Digital Medic co.,Ltd,



Fig. 4. Used sketch designs for coloring experiment

2.1.3 Results and Discussion

The results of the beta wave brain activity of four different writing instruments are shown in Figure 5 and the result of the alpha wave brain activity are shown in Figure 6. Color brush pen and color pencil showed the high value of Beta wave, which of 139% compared to rest condition. Beta wave is related with active thinking and concentration, therefore by using color brush pen and color pencil the user can achieve more concentration of the brain.

The lowest value for the alpha wave was color brush pen by 93% compared to rest condition. It is suggested that color brush pen has softest tip compared to other writing instruments. Thereby the test subject had to be vividly aware to hand movement

of not only the XY-axis of left to right, but also to the Z-axis of up and down movement, leading alpha wave to decline consequently.

From these results color brush pen is demonstrated as the writing instruments which can give most stimulation to the brain.

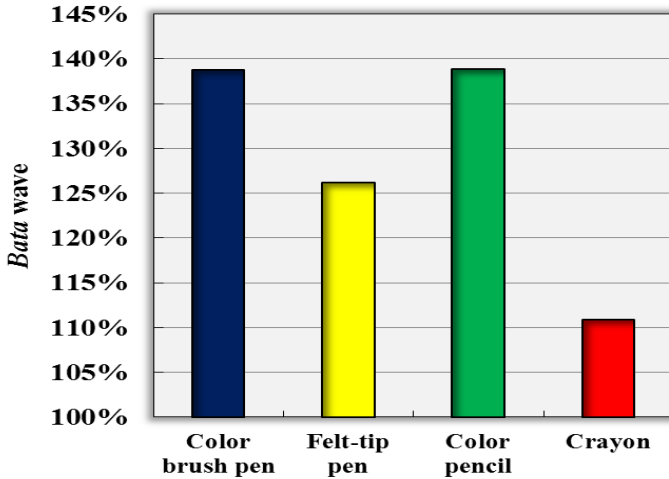


Fig. 5. Comparison of Beta wave between at rest and coloring

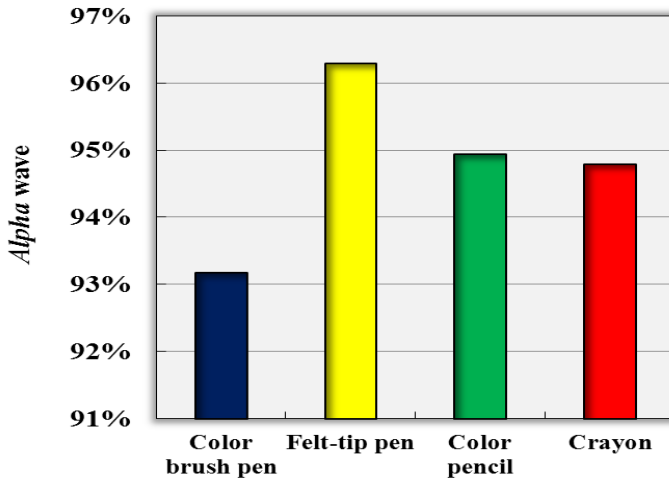


Fig. 6. Comparison of Alpha wave between at rest and coloring

2.1.4 Experiment

In the experiment mentioned earlier, the color brush pen was demonstrated as the most appropriate writing instrument for coloring recreation. For the second part of the experiment, the thickness of the brush was carried to verification using the same

experimental method. Ten test subjects have cooperated in this experiment. The value of beta wave using ordinary size brush and extra thin brush was compared.

2.1.5 Results and Discussions

The result for the changes of beta wave by difference of the thickness of writing brush is shown in Figure 7. The value for ordinary size brush was 136% compared to at rest condition and the value for extra thin brush was 154% compared to rest condition. It is suggested that handling the thinner brush which is more sharply pointed, needs more concentration to handle, causing beta wave to increase. The result shows that extra thin brush is the most appropriate writing instrument for coloring recreation taken place at pay nursing home.

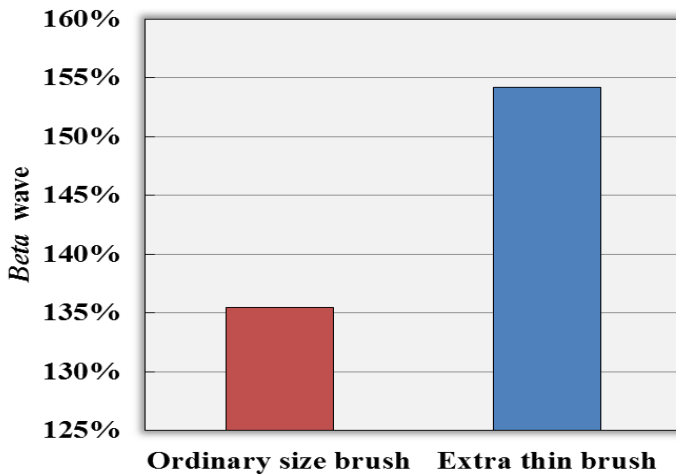


Fig. 7. Comparison of Beta wave between at rest and coloring using ordinary size brush and extra thin brush

3 Coloring Recreation Taken Place at Pay Nursing Home

3.1 Experiments

The experiment of coloring recreation using color brush pen was carried out to pay nursing home tenant. Five tenants who have more behavior problems comparatively with other tenant, such as wandering around, petition of excretion and unnecessary nurse calls were chosen as a test subject. Each coloring recreation was operated for approximately thirty minutes and the frequency of the coloring recreation was two or three times a week, changing according to physical condition of the tenants. The experiment was conducted for three months and the frequency of wandering around, petition of excretion was recorded. Additional experiment was carried out to one other test subject to find out the relationship between number of nurse calls and sleeping

time of the tenant when working on coloring. Checking of sleeping hour was operated once in every fifteen minutes where usually operates once in an hour.

Furthermore, in order to verify the influence of stopping coloring recreation, as for this subject the coloring experiment was stopped after two month and follow-up observations were carried out. The scenery of coloring recreation is shown in Figure 7.



Fig. 8. Scenery of coloring recreation at pay nursing home

3.2 Results and Discussion

3.2.1 The Frequency of Wandering around and Petition of Excretion

The result for the frequency of wandering around and petition of excretion is shown in Figure 8. The average number of wandering around and petition of excretion for five test subject have decreased approximately 40% after three month of coloring recreation. According to the commentary of the physical therapist, the decrease of wandering around frequency and petition of excretion occurred as a result to the plural domains such as cerebral cortex and basal nuclei, cerebellum, the brainstem were activated concurrently by feeling strain increased caused by the effect of coloring. It is estimated that result occurred especially by the change in the function of frontal lobe participating in an accomplishment function.

3.2.2 The Result for Number of Nurse Calls and Sleeping Time

The result for number of nurse calls and sleeping time is shown in Figure 9. After starting the experiment, the number of nurse call decreased dramatically. Due to this change, the hours of sleeping time increased up to average of 4.5 hours per day to 7.9 hours per day in maximum. The number of the nurse calls increased up to 87 times and hours of sleeping time declined again to average of 4.8 hours per day after having finished coloring experiment. This result shows accordance to the research which mentioned about decrease of nurse calls when coloring was carried out at pay nursing home (e.g., Kawabata 2010). Furthermore, as for the increase of nurse calls and

decrease of sleeping hours after stopping coloring experiment, it is suggested that coloring should be carried out continuously to gain effective influence.

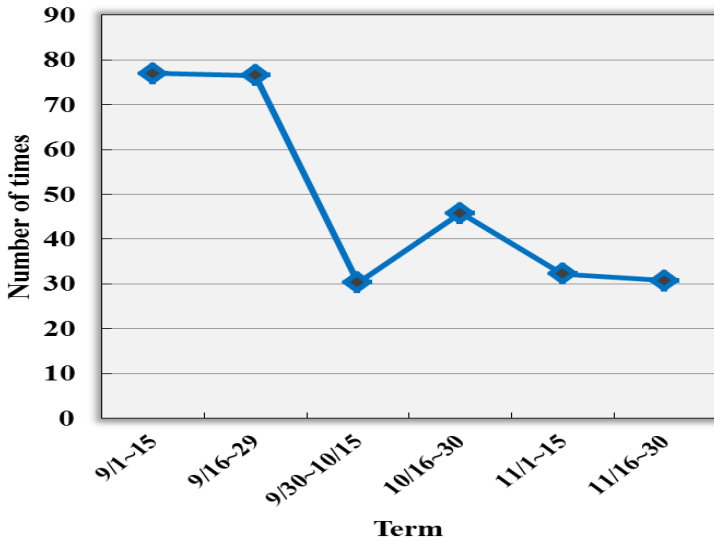


Fig. 9. Average frequency of wandering around and petition of excretion

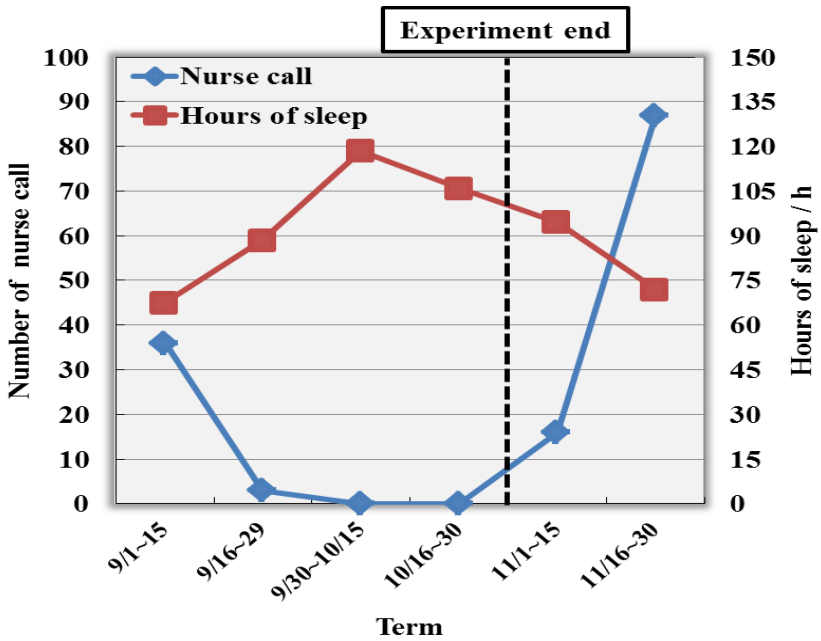


Fig. 10. Results for number of nurse calls and sleeping time

4 Conclusions

In this study, optimal writing instrument for coloring is suggested as extra thin color brush pen. The number of wandering around frequency and petition excretion of the tenant at nursing home decreased due to working on coloring recreation. Coloring is easily done compared to painting and descriptions, also regardless to the needing care degree. More over a care worker's burden can also be reduced because the time for handling unnecessary nurse calls, wandering around and petition of excretion can be reduced. As the result shows, coloring is suggested as an activity that should be taken as one of the recreations at the pay nursing home.

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