



Occupational Therapy (13:30 ~16:00 Lecture Room 4)

Session chairs: Prof. Yuji Sawada

Prof. Eun Young Yoo

Prof. Kunifumi Suzuki

Overview of Occupational therapy in Japan

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This short lecture will focus on Occupational Therapy (OT) in Japan. Contents of the lecture are as follows. Firstly, a brief history of OT will be introduced: 1) precursors of OT, 2) the establishment of ‘the law of PT and OT’, 3) paradigms. Secondly, the characteristics of Occupational Therapists (OTs) and their practical areas are shown: 1) physical dysfunctions, 2) mental disorders, 3) pediatric and developmental disorders, 4) geriatric disorders. Thirdly, educational systems for OTs are informed: 1) schools, 2) educational criteria, 3) post graduate and lifetime education. Finally, the future of OT will be discussed.

The first school for OTs was established as a three year diploma course in 1963. The first national examination for the license of OT was held and Japanese Association of Occupational Therapists (JAOT) was formed in 1966. JAOT joined WFOT an associate member in 1970 and then, became a full member in 1974. According to the roster of OTs registered in 2010 (JAOT, 2010), there are 53,080 OTs in Japan. There are more female OTs than male – the ratio is two to one - and almost a half of OTs are under 30 years old (JAOT, 2010).

Seventy percent of OTs are working in clinical settings (hospitals and clinics) and the rest of them are working at geriatric facilities or welfare institutions in their communities (JAOT, 2010). Major practical fields are physical (36%), geriatric (25%), mental (15%), and developmental (7%) areas (AJOT, 2005). OT is covered by both national health insurance and national long-term care insurance.

There are now 171 schools (187 courses) with around 7,000 OTs graduating each year. Various kinds of schools are being founded, such as 3 year diploma course, 4 year diploma course, 3 year associate degree course, and 4 year degree course. In addition, 32 Master courses and 22 doctorate courses have been firmly established (JAOT, 2009).

In recent years, we are striving for increasing OT in the community including private homes, group living, institutions as permanent living places, public schools, health centers, and local government beyond hospitals. Super aged society (aged proportion: 22.7% in 2009), and the philosophy of independent living and normalization, encourage us to move into the community where we will be able to contribute further to expanding aspects of OT: not only aiding the recovery of functional components, but also helping clients engage in meaningful occupations, assisting with home modifications, supporting accommodation to own environment, adapting devices and aids, and collaborating with other professions.

The ultimate purpose of OT is for all the people who require OT to live their lives in hope and with value.

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The Beginning and Development in the Field of Occupational Therapy in Korea

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The field of occupational therapy in Korea began in 1950 for the purpose of treating injured persons during the Korean War. Western missionaries took a primary role in providing the foundation of occupational therapy in Korea. The national licensure examination system was implemented in 1969 and has been given yearly to the present time with an average passing rate of 78%.

Undergraduate education of occupational therapists began in 1979 at Yonsei University and currently, there exist 27 3-year colleges and 21 4-year colleges and universities that provide education in occupational therapy. Currently, approximately 1,000 college graduates are being admitted as first-year college students each year, with a total of 5,403 registered occupational therapists. The average employment rate for occupational therapists between 2007 and 2009 stands at 85%.

In regards to the gender distribution of occupational therapists, 82% are female and 18% are male. With the rapid installment of occupational therapy departments across the nation, the average age group of occupational therapists has also declined such that 69% of occupational therapists are currently in their 20's. Occupational therapists are working in diverse locations such as rehabilitation hospital, medical centers, local clinic, welfare facilities, and institutes. A majority of occupational therapists (67%) are employed in rehabilitation hospitals and medical centers, working primarily with individuals with physical disabilities and only a minority working in the mental-health field.

The Korean Association of Occupational Therapist (KAOT) was established in 1993 and has been responsible for securing members' professional rights, entry into diverse professional fields, and continuing education of its members. KAOT and a number of occupational therapy undergraduate programs have received accreditation from the World Federation of Occupational Therapy (WFOT) in 1998. Currently, there are 5 colleges whose curriculum has been accredited by the WFOT. The Korean Society of Occupational Therapy began its journal publication in 1993 for the purpose of qualitatively improving research in the field of occupational therapy in Korea and is being published quarterly. The Journal of Korean Society of Occupational Therapy has been accepted into the Korea Research Foundation citation index, the most prestigious journal evaluation institute in Korea.

The KAOT is currently putting in all of its effort into passing appropriate federal regulations that will open doors for occupational therapists to enter the field of mental health, in addition to collaborating with other disciplines and working to provide and implement policy guidelines and systems to meet the growing elderly population similar to Japan.

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BIOLOGICAL OBSERVATION DURING THE DAYTIME OF ELDERLY PATIENTS WITH ADVANCED DEMENTIA CARED FOR WITH AND WITHOUT ARTIFICIAL NUTRITION BY PERCUTANEOUS ENDOSCOPIC GASTROSTOMY

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Introduction

One of the interventions for patients with a poor oral intake has been enteral tube feeding by percutaneous endoscopic gastrostomy (PEG). [1] Although the potential benefit of PEG to improve a patient's nutritional condition has been emphasized, the role of treatment in patients with advanced dementia has recently been debated, [2] and the number of systematic studies on demented patients treated with PEG is still limited.

The objectives of the present study were to overview the activity of elderly patients with advanced dementia cared for with and without artificial nutrition by PEG in a care facility. Focusing on awake and sleep states and oral movement of the patients, we continuously recorded and quantified the awake/sleep states and spontaneous swallowing movement during daytime in demented patients.

Materials and Methods

Twenty-six subjects participated in the present study. Thirteen demented patients (one male and twelve females, mean age: 84.0 ± 6.2 (years, \pm SD) years) received artificial nutrition by PEG (PEG-patients), and 13 patients (one male and twelve females, mean age: 80.2 ± 4.7 with dementia took meals orally (OR-patients). PEG- and OR- patients all suffered from advanced dementia.

PEG-patients could not answer any question in the minimal state examination (MMSE), while the mean MMSE score was 7.8 in OR-patients with statistically difference from that in PEG-patients (t -test, $p < 0.01$).

We selected Wednesday as the day of the experiment, since bathing and outside activities were not scheduled for that day. We carefully observed and described each subject's behaviors every 10 min, such as eating, talking, and attending activities.

EEG signals were recorded from two scalp areas, Oz and C3, with referential electrodes of linked earlobes, using surface electrodes, which were 7-mm silver-silver chloride disc electrodes. Those recording areas were selected to observe alpha basic activity and sleep-specific responses, the vertex potential and sleep spindle. EMG signals for oropharyngeal movements were recorded using a pair of surface electrodes. Recording and reference electrodes were placed on the thyroid cartilage and chin along the midline, respectively, and an earthing electrode was positioned on the midpoint of the left clavicle. EOGs were recorded from the right eye, placing electrodes 2 cm below the infra-orbicular edge and 2 cm lateral to the lateral canthus of the right eye.

The Biological signals were evaluated every 5 min. Awake and sleep states, i.e., being awake or asleep, were investigated based on EEG signals. Awake/sleep states were evaluated, but we partially modified the score with EOG data. The period of time in awake/sleep states was expressed as a percentage of the recording period, since the total recording period varied in each subject, as described in the results. From EOG signals, the period of time spent blinking or showing step-wise rapid (saccadic) eye movement, corresponding with the full-awake state, was measured.

We showed comparisons of values recorded between OR- and PEG- patients. The time period of awake/sleep states was compared between the groups using one-way analysis of variance (ANOVA) with a post-hoc test (Fisher's protected least significance test, Fisher's PLSD test). The swallowing frequency was compared between PEG- and OR-patients using a t -test. Since the dementia score, MMSE, was zero in all PEG-patients, the effect of MMSE score on the awake state and swallowing frequency was tested. Correlations between the MMSE score or BI and amount of time in an awake state, and between the MMSE score or BI and number of spontaneous swallowing movements were tested in OR-patients, using Bartlett's test. P -values less than 0.05 were considered to be significant.

The awake/sleep score was determined every 5 min as: FA: 3, RA: 2, Sleep (S1 or S2): 1. The mean awake/sleep score every 20 min from 7:40 to 17:00 was calculated in each subject, and the value every 20 min was compared between PEG- and OR-patients, using the t -test.

Results

EEG, EMG, and EOG signals were successfully obtained from all patients. Some periods were omitted from analysis due to physical intervention, such as transferring, toilet, etc., and the total recording period was 412 (6 hours and 52 min) ± 42 min (SD). Since a light-sleep state (S2) was defined by spontaneous sleep spindles, it was difficult to identify the onset and end of S2 during the recording period. Thus, FA, RA, and sleep (S1+S2) states underwent to statistical analysis.

There was a significant main effect ($F(5, 72)$, $p < 0.001$) of the sleep state, and there was a significant difference in the amount of time in FA ($p = 0.0041$) and S1 ($p = 0.0013$) states between PEG- and OR- patients (Fig. 1).

The spontaneous swallowing frequency was also significantly lower in PEG-patients (0.1 ± 0.3 , times per hour) than in OR-patients (3.4 ± 5.2 , $p < 0.001$). There was no significant correlation between the MMSE score or BI and period of time in an awake state (MMSE: $r = 0.227$, $p = 0.465$, BI; 0.406 , $p = 0.173$), and between the MMSE score and number of spontaneous swallowing movements ($r = 0.435$, $p = 0.140$) in OR-patients. However, the BI and number of spontaneous swallowing movements correlated significantly in OR-patients ($r = 0.863$, $p < 0.001$).

Sequential changes in the awake/sleep score during the day for all subjects are shown in Fig. 2. The score was significantly greater, i.e., more awake, in OR-patients from 7:40-8:40, 9:40-10:00, 11:20-11:40, 12:00-13:00, and 16:40-17:00 (Fig. 2).

Discussion

The present study investigated actual awake/sleep states and the swallowing frequency in demented patients with and without artificial nutrition in a care facility during the day. To our knowledge, such detailed observations have not hitherto been reported. Besides decreased physical and mental activities in patients with advanced dementia, present study showed: 1) shorter awake and longer sleep states, 2) the frequency of spontaneous swallowing was markedly lower in PEG-patients,

while the value correlated with BI in OR-patients; 3) The length of time in an awake state and swallowing frequency were not always related with the MMSE score in OR-patients; 4) the awake/sleep pattern during the daytime was variable in PEG-patients, and meal times were the limited periods keeping OR-patients awake consistently.

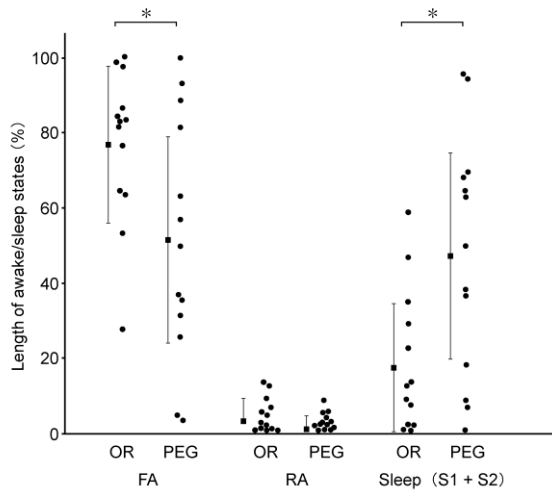


Figure 1: Length of awake/sleep states during the recording period in demented patients undergoing artificial nutrition by PEG (PEG) and patients with dementia who took meals orally (OR). The value was significantly different in the full-awake state (FA) and sleep states (S1 and S2) between OR- and PEG-patients (* $p < 0.01$). There was no difference in the value for the rest-awake (RA) state. A solid square (■) and vertical bar indicate the mean and standard deviation, respectively in each patient group.

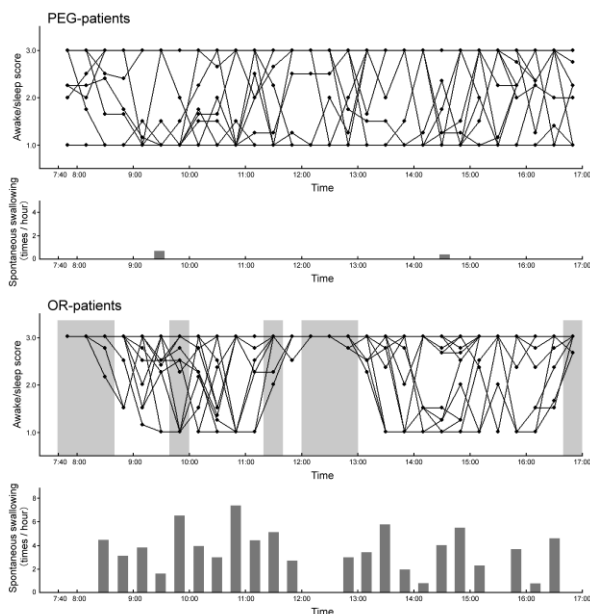


Figure 2: Sequential changes in the awake/sleep score (Full-awake: 3, Rest-awake: 2, and Sleep: 1), and spontaneous swallowing movement (times per hour, solid bars) for PEG- and OR- patients during the daytime. Gray areas indicate the time period in which the sleep score was significantly higher in OR- than in PEG-patients ($p < 0.05$, t-test). Values for each patient are linked by lines. Each value for swallowing was average value for all subjects. Swallowing movements during meals were omitted.

An awake state was maintained during breakfast and lunch times in OR-patients, significantly differing from the awake/sleep states in PEG-patients. However, in other words, awake/sleep states were not different between PEG- and OR-

patients during period between meals. For those patients with advanced dementia, meal times could be the only time keeping them awake, but there was no such opportunity for PEG-patients. Apart from nutritional cycles, the awake/sleep rhythmicity was important regarding the cognitive function in patients with and without dementia. [3] Due to the lack of daytime rhythmicity set by meals, another intervention to maintain the awake/sleep rhythmicity might be considered for PEG-patients.

Concerning the spontaneous swallowing frequency, He et al. [4] reported that a high-risk group for aspiration pneumonia showed a depressed swallowing function. Since spontaneous swallowing movements convey oral bacteria into the stomach and regulate the quality and quantity of oropharyngeal secretions in the pharynx, such movements are an important mechanism for pneumonia prevention. [5] Most of the OR-patients and all PEG-patients in the present study were within the high-risk range for aspiration pneumonia, and some of them had a history of it. Although oral intake was prevented, aspiration pneumonia remained as one of the major problems in PEG-patients. [6] It is of no doubt that pneumonia has been a leading cause of mortality among patients in care facilities, especially demented patients with a poor oto-pharyngeal function, [7] and PEG intervention seems to prevent a direct risk of poor nutrition. However, frequency of spontaneous swallowing more decreased as lower score of BI, and it almost diminished in PEG patients with zero of BI. From the aspect of the spontaneous swallowing frequency, we considered that the risk of pneumonia could never be reduced in PEG-patients.

Conclusions

We reported awake/sleep states and spontaneous swallowing movements during the daytime in demented patients cared for with and without PEG intervention. In the present study, serial recording of biological activity could give us precise knowledge of what happens in patients with advanced dementia and those after PEG intervention. It also gave us information regarding actual sleep pattern and temporal characteristic of a risk factor of aspiration pneumonia, spontaneous swallowing, and their relationship with MMSE and BI in those patients.

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OCCUPATIONAL THERAPY AS A CAREER: KOREAN UNDERGRADUATE OT STUDENT'S PREFERENCES AND CONCERNS REGARDING THEIR FUTURE AS OCCUPATIONAL THERAPISTS

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Introduction

With the growing number of newly graduating occupational therapy students, there has been recent concern regarding the future job market for occupational therapists and emphasis on the need to reorganize the areas of OT service in Korea. The present study analyzed Korean undergraduate occupational therapy (OT) students' preferences and concerns regarding their future as occupational therapists using a survey method. The primary purpose of this study was to examine (1) OT students' reasons for choosing occupational therapy as their major, (2) their thoughts and beliefs concerning their future as occupational therapists, and finally (3) to contribute to the development of the field of OT in Korea by providing information regarding students' preferred fields of employment and their professional interest areas.

Materials and Methods

The participants in the study were 1,666 Korean undergraduate OT students from 19 universities and colleges across Korea. A packet of questionnaires was given to students. The questionnaire was made up of three different areas: (1) students' demographic characteristics in addition to reasons for selecting OT as their major, (2) concerns and anxiety regarding their future, and finally (3) their current preferred field of employment and professional interest areas. Demographic variables included variables such as year in college, student group type, gender, age, and religion. Students were asked to choose among 7 reasons that led them to choose OT as their major. 16 items on a 4-point Likert scale were created to address students' concerns regarding their future as occupational therapists. Lower score indicated greater future career concerns. Students also responded to a question regarding their preferred field of employment. Data was analyzed using SPSS 12.0.

Results

(1) Demographic Characteristics

A total of 723 universities and 606 colleges that had departments of occupational therapy were represented in the present study. The sample consisted of 352 (26.5%) male and 977 (73.5%) female students. The sample consisted of 483(36.3%) freshmen, 457 (34.4%) sophomore, 335 (25.2%) juniors, and 54 (4.1%) seniors. The student group type consisted of 1139 (85.7%) currently enrolled students, 133 (10%) students returning to school after taking time off, 28 (21%) transfer students, and 27 (2%) readmission students.

(2) Reasons for Selecting OT as their Major

The results indicated that 675 (50.8%) OT students chose OT as their major following recommendations made by others (parent, teacher, sibling). 654 (49.2%) OT students replied that they chose the major on their own. The principle reason for recommendation and selection was to work in a professional field or to secure employment. 476 (70.4%).

(3) Thoughts Concerning their Future

The results indicated that 693 (52.1%) OT students have high career confidence, 504 (37.9%) OT students have average career confidence and 117 (8.8%) OT students have low career confidence when they first entered the department. However, 362 (27.3%) OT students reported high career confidence, 603 (45.4%) OT students average career confidence and 352 (26.4%) OT students low career confidence presently. Such results indicate that career confidence is lower in the present than in entering school. Female students reported greater future career concerns than male students. Freshmen reported greater future career concerns than sophomores, juniors, seniors. 831 (62.5%) OT students hoped to transfer to another academic department.

(4) Preferred Field of Employment and Professional Areas of Interest

The results indicated that most 1157 (36.4%) OT students were most interested in the areas of mental health, physical disability, and autism-spectrum disorders, respectively. The most desired place of work following graduation was in a medical center / teaching hospital (n=908; 68.3%). This preference held true in students' response to the question, "Where would you like to be working in 10 years?". OT students indicated that would prefer working with the children (n=792; 40.6%), followed by the adult population (n=632; 32.3%) and elderly (n=425; 21.7%).

(5) Additional Analysis: Relationship between OT Students' Demographic Characteristics and Preferences and Concerns Regarding their Future

First of all, there was a meaningful effect of gender on future career concerns. Female students reported greater future career concerns than male students ($t = 3.46, p < .05$). Second, there was a meaningful positive correlation between year in college and career concerns. More specifically, the higher the year in college, students reported greater future career concerns ($r = -.126, p < .01$).

Conclusions

In conclusion, the results of the present study indicate that Korean OT undergraduate students' degree of future career concerns is affected by factors such as gender and year in college. This suggests the need for departments in OT to tailor their education and student mentoring depending on students' gender and year in college. Also, this study indicates that the preferred interest or work field of Korean OT undergraduate students was mostly limited to medical institutions. Therefore, further guidance is required to expose OT students to more diverse areas of interest and work field.

Memo

ALTERATION OF TIME PERCEPTION IN YOUNG AND ELDERLY PEOPLE DURING JIGSAW PUZZLE TASKS WITH DIFFERENT COMPLEXITIES

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Introduction

Recent studies have suggested that subjective time perception is strongly linked to the quality of activity performed. [1] Thus, time perception is an important factor during occupational therapy, which might promote clients' positive experiences. [2]

Abnormal time perception has been reported in patients with dementia, [3] but little is known regarding the neuropsychology and pathophysiology of time perception. Contrarily, the time perception of clients may give us information regarding their physical and mental states. We suggest that time perception is informative to evaluate clients' psychological and pathological conditions. Previous studies reported time perception among ages and tasks, [4] but the results were not consistent.

In the present study, focusing on healthy people, we investigated time perception in young and elderly people during tasks. We discussed the psychological mechanisms of time perception during tasks based on the hypothesis of Larson and von Eye. [2] The objective of this study was to clarify the characteristics of time perception in the clinical situation of occupational therapy (OT), along with the performance of a globally well-known jigsaw puzzle tasks.

Materials and Methods

Twenty-eight elderly (8 men and 20 women, mean age: 69.9 ± 6.2 (SD) years, range: 60-85) and thirty-one young (8 men and 23 women, mean age: 21.9 ± 1.4 , range: 18-24) participants were involved in the present study. All participants had no motor, sensory, or cognitive symptoms, and no history of neurological diseases. The elderly subjects had no behavioral or clinical symptoms of dementia or mild cognitive impairment, and their scores in the mini-mental state examination were in the normal range over 28 points. They had no detectable visual, auditory, or speech disturbance on performing jigsaw puzzle tasks, and they had no speech disturbance on answering questions asked by examiners.

Participants were asked to complete two jigsaw puzzles with different complexities, and a time estimation test was applied during the puzzle tasks. All tasks were performed in a quiet room in the afternoon.

Time estimation tests were performed during the two puzzle tasks. One was a simple task with 24 pieces, and the other was a complex task with 54 pieces. Participants were randomly divided into two groups; those who performed the 24- or 54-piece puzzle first (cross-over design). They were specifically instructed to concentrate to complete the puzzle tasks. Examiners told participants to start a puzzle task on hearing a beep sound and to stop the task 17 minutes and 17 seconds after the onset on hearing another beep sound. The fixed duration of the tasks, 17 min and 17 sec, was chosen as an unpredictable time.

Just after stopping the puzzle task, participants were asked to verbally answer how long in minutes and seconds they thought they had spent on the task. After the two puzzle and time estimation tasks, subjects were asked to answer a

questionnaire regarding interests and feelings during the puzzle tasks.

We measured the time required to complete each puzzle task and, then the ratio of the subjective to absolute duration of time, the duration judgment ratio (DJR), [6] was calculated for each task. A DJR of 1.0 indicates that the participants estimated time was equal to the actual time, whereas a DJR of less than and greater than 1.0 indicates under- and overestimation of time, respectively. The values of tasks obtaining groups performing the 24- or 54-piece task first were averaged. The time required to complete the puzzles and DJR values were compared using two-way (groups and tasks) analysis of variance with Tukey-Kramer's tests for multiple comparisons. For subjective feelings, the DJR values were compared among the four grades of interest and among the four different feelings employing Mann-Whitney tests. A p-value less than 0.05 was considered significant.

Results

Twenty-six and two elderly subjects completed 24- and 54-piece jigsaw puzzles, respectively, and all young subjects completed both puzzles. Excluding subjects who did not complete the puzzle, the elderly group took 486.14 ± 209.87 (mean \pm SD) and $1,035.32 \pm 6.24$ sec, and the young group needed 127.29 ± 33.77 and 466.65 ± 115.28 sec for the 24- and 54-piece jigsaw puzzles, respectively (Fig. 1). The elderly group required significantly longer time than the younger group ($F [1, 114] = 444.5, p < 0.001$, ANOVA). The DJR values are shown in Fig. 1. Both elderly and young subjects estimated that tasks took a longer time than they actually did, i.e., the DJR value was more than 1.0. The effect of group on the DJR was not significant in each task ($F [1, 114] = 0.75, p = 0.385$). However, the effect of the task on the DJR was significant ($F [1, 114] = 31.75, p < 0.001$), and the value was greater in the 24- than in the 54-piece task in both groups ($p < 0.01$, Tukey-Kramer's test).

The number of subject, who felt the task was difficult was higher in the elderly group than in the young group in each task ($p < 0.05$, Mann-Whitney tests). The number of young subject who answered that the task was interesting was greater than in the elderly subjects for the 54-piece task ($p < 0.05$).

Among the sub-groups of each grade of interest, the DJR was smaller in the group with "much interest" than in that with "little interest" for the 24-piece task ($p < 0.05$, Mann-Whitney tests), but there was no difference for the 54-piece task. Subjective feelings of "engaging", "difficult", and "enjoyable" had no effect on the DJR.

Discussion

The present results can be summarized as: 1) subjects estimated that tasks took a longer time than they actually did, 2) subjects estimated a longer time for the 24- than 54-piece task, 3) there was no difference in the time estimation between young and elderly groups, although the feeling of difficulty was significantly different between the groups, and 4) subjects interested in the task estimated a time shorter than those not interested in both the young and elderly groups. The present

study clarified behaviors in young and elderly subjects regarding time estimation, which have been theoretically reported. [2]

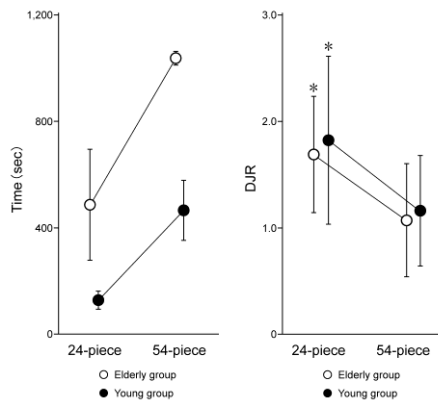


Fig. 1: The mean time required for the puzzle tasks (left). The elderly group required a significantly longer time than the younger group for both tasks ($p < 0.01$, ANOVA). The mean duration judgment ratio (DJR) during the tasks (right). Both elderly and young subjects estimated a time longer than the actual time during the tasks. The effect of group on the DJR was not significant in each task, while the effect of the task on the DJR was significant ($p < 0.001$). The value was greater in the 24- than 54-piece task in both groups (* $p < 0.01$, Tukey-Kramer's test). Each vertical line indicates a standard deviation.

The DJR value was more than 1.0 in both tasks in both young and elderly groups. This indicated that the subjects felt that the time passed slower than it actually did during the tasks. Between the tasks, the 24-piece task had a greater effect on the prolonged time estimation of subjects than the 54-piece task in both groups. These results regarding the subjective estimation of time are generally in line with those in previous studies. [5]

Coelho et al. [4] reported a change in the estimation and production of time intervals with aging, suggesting an association of aging with a faster "internal clock", which resulted in a longer subjectively estimated time than the absolute time, at least over a short duration around 10 sec. Since our time estimation task required a relatively long time, 17 min and 17 sec, it might not be possible to compare the results to previous ones.

One explanation concerning the effect of aging in the present study may be plausible, based on Larson's model of time perception (Fig. 2). [2] Time perception could be explained by the task content, as well as psychological condition. When a task during time estimation was successful, time passed slowly, i.e., a low DJR. On the other hand, when the task was challenging, subjective time passed quickly. When the task was difficult being beyond subjects' ability, the estimated time again became long. During the 24-piece task, both young and elderly subjects successfully performed the task. Young subjects were challenged by the 54-piece task, and their subjective time estimation was shorter than for the 24-piece task. However, for elderly subjects, the 54-piece task was difficult to perform, and the time estimation was long in the range of "beyond ability" (Fig. 2). We considered that it was important to take into account not only the absolute complexity of tasks, but also subjects' feelings during tasks or how they performed in them.

Similarly, another novel result in the present study was that the subjects' feelings of interest in the task affected the time estimation. This result suggested that time perception during a task, or an occupation, could be modified by one's

mental attitude and manner, and that involvement with interest in a tasks shortens a subject's time perception. Besides relative factors should be important to manage the time perception of clients during occupational therapy, since spending a fruitful time and the quality of daily activities could be linked to time perception. [2]

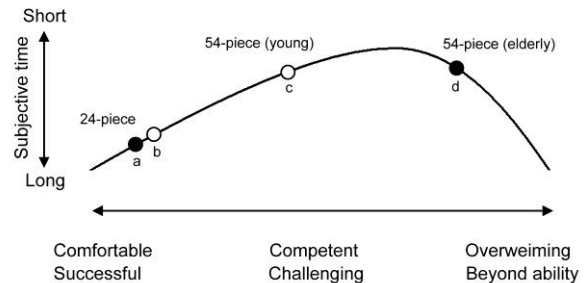


Fig. 3: Hypothetical explanation of the results for time estimation in young (open circles) and elderly (solid circles) subjects of the present study (the time estimation curve is a modified figure of Larson and von Eye. [2] For the 24-piece task, both groups performed it successfully (a and b). For the 54-piece task, young subjects were challenged (c), while it was too difficult for elderly subjects to complete (d).

Conclusions

In conclusion, we investigated the characteristics of time perception in the clinical situation of occupational therapy along with the performance of jigsaw puzzle tasks. Subjective feelings modified time perception in both young and elderly subjects, and a part of the results could be explained by a model of time perception in an occupation. Occupational therapists can consider these features. As Larson and von Eye [2] pointed out, if the client perceives a daily task as disinteresting, there are shifts in mindfulness during the task or an increase in cognitive and emotional involvement. Conversely, if a task of daily living is too challenging, the therapist might redesign the task by reducing the complexity and increasing the client's skill. By knowing characteristics of time perception in each client, occupational therapists could use such knowledge to use the time for interventions effectively, as well as employ it as personal information on the client.

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EFFECTS OF SCHEDULED EXERCISE PROGRAM COMBINED WITH FORCED USE ON UPPER EXTREMITY FUNCTIONING IN INDIVIDUALS WITH HEMIPLEGIA

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Introduction

Although individuals with hemiplegia need continuous therapy to improve upper extremity functioning, they spend most of their time alone and not exercising spontaneously outside the outpatient clinic setting (Bernhardt, Chan, Nicola, & Collier, 2007). The goal of the present study was hence to suggest the potential effectiveness of an exercise program that can encourage client's voluntary participation while minimizing therapist involvement. More specifically, the purpose of this study was to investigate the effects of scheduled exercise program combined with forced use in improving upper extremity functioning in individuals with hemiplegia.

Materials and Methods

Participants: Two males and one female diagnosed with chronic stroke participated in the present study. The inclusion criteria were as follows: (1) a minimum of 6 months post single unilateral stroke and currently neurologically stable, (2) no significant cognitive deficits as indicated by a score > 25 on the Korean Mini Mental Status Examination(MMSE-K)(Kwon & Park, 1989), (3) ability to actively extend at least 10 ° at the affected metacarpophalangeal and interphalangeal joints and 20 ° at the more affected wrist and (4) no balance problems that may compromise safety.

Design: A-B-A'-C reversal design was used in the study.

Setting: Home-based.

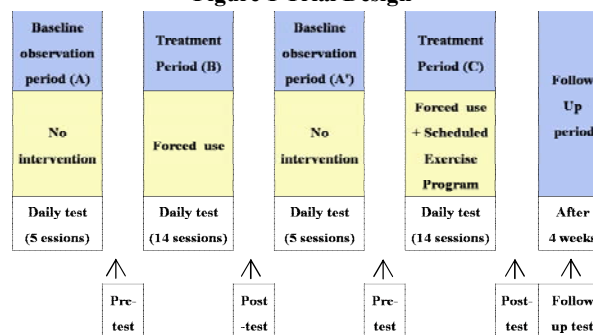
Intervention: The treatment process consisted of two conditions: forced use only (B intervention period) and individual customized scheduled exercise program in addition to forced use (C intervention period). During the B and C intervention periods, participants had their healthy arm immobilized by wearing mittens for 6 hours such that they were not able to manipulate objects using the non-affected hand. During the C intervention period, exercise programs were conducted 14 times along with forced use according to the fixed schedule. A total 10 activities (5 tasks targeting arm functioning and 5 tasks of activities of daily living: ADL) were adopted which differed across the three participants based on their level of functioning in the affected upper extremity. The present researcher selected tasks for improving arm functioning based on individual's performance with the goal of improving functioning of the shoulder, elbow, hand, and finger. ADL tasks were determined based on information gathered from participant and caregiver interviews, with the goal of selecting tasks that were deemed essential in minimizing other's help.

Outcome measures: The Box and Block Test (BBT)(Cromwell, 1976) and the Wolf Motor Function Test (WMFT)(Wolf, Lecraw, Barton, & Jann, 1989) were used to assess motor function of the upper extremity. Participant's rate of performance of assigned activities was determined by the number of assigned activities accomplished on a day divided by the total of 30 activities multiplied by 100. To determine the rate of implementation of scheduled exercise activities, the number of scheduled exercise tasks implemented on a day divided by the total of 10 assigned tasks multiplied by 100. The Motor Activity Log(MAL)(Page, Sisto, & Levine, 2002) was

used to assess ADL. In order to examine the psychosocial status of the participants, the Self-Esteem Scale (Rosenberg, 1965) and the Psychosocial Well-Being Index Short Form (SF-PWI)(Chang, Cha, Won, & Koh, 2001) were measured pre- and post-intervention.

Data analysis: The scores for each participant on the above-mentioned outcome measures were visually analyzed using graphs.

Figure 1 Trial Design



Results

The results of the present study can be summarized as follows:

1. Performance rates to measure motor functioning of Participant 1, 2, and 3 were 99.0%, 22.1%, and 74.6%, respectively, on the BBT. Compared to the baseline period, the number of wood blocks which were moved during the period of intervention improved. The degree of performance on the WMFT showed improvement in the post-intervention period C compared to the baseline A period and the amount of time needed to complete the tasks also decreased.
2. Performance rates on tasks of ADL for Participant 1, 2, and 3 were 57%, 113%, and 48.8%, respectively, markedly improving from the baseline period. Results from the MAL indicate improvement in the use and quality of movement in the post-baseline C period compared to the baseline A period.
3. During the intervention C period, the implementation rates of ADL schedule for Participant 1, 2, and 3 were 85%, 70%, and 90%, respectively.
4. On measures of psychosocial status, improvement in self-esteem was found for Participant 1 and 3, while their sense of psychosocial stress declined. For Participant 2, the self-esteem score declined and the psychosocial stress remained unchanged.

Conclusion

The results of the present study indicate that scheduled exercise program combined with forced use had positive effects on improving upper extremity functioning and activities of daily living in persons with post-stroke hemiparesis in the home setting. Such scheduled intervention program also showed partial effects on improving psychosocial status. Furthermore, the present study also suggests that chronic stroke patients can take part in exercise programs on their own within the home setting and improve upper extremity functioning without therapist intervention.

Key Words

Activities of Daily Living, Arms Function, Forced Use, Schedule, Stroke

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