

Report

Research Activities in the Department of Occupational Therapy

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Even though the purpose of the services provided by occupational therapy is to help and to support the daily life of clients, the actual services extend to a wide range of daily activities. Thus, research in occupational therapy covers a wide range of activities which can be modified and changed according to the needs of clients. Research activities conducted by clinical psychologists and English teachers who staff the Department of Occupational Therapy at Aino University are also summarized below.

1. Research in Occupational Therapy for Physically Handicapped.

We are involved in a study of the efficient motion analysis in the activity of daily life (ADL) in part with the staff of the Department of Clinical Engineering. We analyze the muscle tone under various locomotive operations by quantifying muscle tone with surface electro-myography (EMG).

We have studied the brain network related to memory and learning in the training tasks that enable effective learning skills and their clinical application. The first phase of the research project is to clarify the relationship between the working memory network and the default-mode network before and after the memory task with different level of difficulty. In recent years it has been demonstrated that several brain networks, not only the working memory, are functioning in concert in human behavior control. The default-mode network, active at the resting or in shallow sleep stage, is believed to be related to the

memory storage by activity representing the working memory network. We are trying to elucidate the relationship between the working memory network activity and the change in the difficulty levels of the learning tasks, and we further investigate the involvement of the default mode network activity in learning tasks with different difficulty levels, which may lead to the proper setting of the difficulty level in the learning task based on the scientific evidence in effective skills learning (including episodic memory).

The study of functional magnet resonance imaging (fMRI) as described above is usually executed in a special experimental environment, and the learning task itself carried out in experiments is quite different from those in daily life. The effective challenge set obtained from the fMRI experimental results cannot be applied to actual life. It is also expected that some fMRI study is too difficult to the elderly or patient volunteers. In addition to fMRI for the measurement of the default-mode network, we are planning the functional brain imaging experiments with near infra-red spectroscopy (NIRS).

The data from pressure distribution measurement in sitting position and the data from eye camera system can be utilized to evaluate the posture of the subject in sitting position and the observation of the subjects under the task, which will be analyzed for the development of the suitable planning of occupational therapy required by each individual.

2. Occupational Therapy for Mental Disorders

The previous study carried out in the Department of Occupational Therapy has demonstrated that the stigma associated with the mentally handicapped is still strongly held among the general population. It is also evident that the stigma is prevalent among students, but can be lessened through education and practical training in psychiatry. Currently, it is pointed out that medical experts including professionals in psychiatric rehabilitation are responsible for disseminating the stigma associated with the mentally handicapped. Furthermore, the mentally handicapped themselves are involved with self-stigmatizing their own disorders, an issue which needs to be studied and resolved in accordance with the anti-stigma movement against mental disorders.

We are trying to educate students in psychiatric rehabilitation to be professionals who can make the right decision and conduct themselves properly through a thinking process based on scientific evidence. As an added project, we are planning the study of a rehabilitation method related to behavioral and psychological problems associated with dementia (BPSD) among the elderly with Alzheimer disease, which is rapidly increasing in present-day society.

3. Occupational Therapy for Developmental Disorders — Including Physically Handicapped

We are analyzing the “anxiety” phenomenon (“Kininaru” in Japanese) from the perspective of the behavior of children with developmental disorders. In this research, we are working in collaboration with Osaka Medical College through a multidisciplinary joint research project to study Japanese handwriting disorder. The project is focused on dysgraphia, which is one of the main symptoms of children with learning disabilities. We are trying to correlate the cognitive and motor function related to dysgraphia. Based on our findings, we are developing software that can evaluate the descriptive ability of 5-to-6-year-old children using a tablet and touching stylus representing the cognitive and motor function related to writing dysfunction of the children with learning disorders.

The number of status reports with background behavior for second-half children (ages 4-6) received from special needs facilities has increased

significantly. But the definition of “anxiety-prone child” differs from researcher to researcher. It is important to objectively capture the activities of anxiety-prone children, to understand the background behavior, and to analyze the information from various points of view, which is eventually expected to lead to the appropriate support for handicapped children. We are analyzing the movement aspects of 300 children enrolled in these facilities to record objectively the children’s behavior by using the SDQ.

Furthermore, we are investigating the relationship between attention span and body stem retention ability to improve the academic achievement and physical fitness of the children. We are involved with the study and practice viewed from the micro-slip, through special needs in education for the support and development of infants and children. We are working in cooperation with the local education committee and elementary schools in a model project for the construction of an inclusive education system.

4. Survey and Effective Clinical Training for Unfair Treatment”

Clinical practice accounts for a significant part of the educational curriculum for occupational therapists so we are studying the actual data for courses related to unfair treatment in clinical training. The project is studying the methodology for occupational therapist clinical training that has remained unchanged since the launching of the legislation for physical and occupational therapists 50 years ago. We want to verify the method for future clinical training.

5. Teaching and Accreditation Method through Volunteer Activities

We strongly believe volunteer activity is important for students. We are studying the effect of volunteer activity upon students in an effort to implement a system for educating people active in the field, including accreditation for volunteer coordinators. In the Department of Occupational Therapy, we will striving to establish an educational system that is suitable for present-day and future needs.

6. Research on Social Participation for Sports Disabilities

Since 2014, we have promoted research in the role of occupation therapy for practitioners

participating in wheelchair handball and its effects on the academic level of students. Its current orientation is still in the initial phase, but in the future, we anticipate seeing improvement not only in the practice level, but also advancement towards educational benefits and social participation.

7. Effectiveness of Dancing to Various Disorders

As well as to more clearly the effectiveness of Dance therapy for Parkinson's disease, to advance the validation of neuro-dance against dementia or mental illness, developmental disabilities.

8. Research for Grief Care System

Grief care due to bereavement has been placed outside of medical service. Due to the aging society in recent years, the number of two-person households and single elderly households has increased. We think a system to care for grief after bereavement of a spouse should be initiated. Currently we are endeavoring to build a grief care system after bereavement in cooperation with the Kyoto Grief Care Association. The system utilizes funeral homes as its first encountering site for grief care, as well as to promote education for grief confusion and grief care.

As for medical care in palliative situations, nurses, midwives, and health professionals working in the field of neonatal care are the targets of our activity in education related to grief care. We are hoping to build up the grief care system in the near future to promote knowledge of grief care to medical professionals and also to the general public. We will proceed with research for suicide prevention and personality psychometry for young people, mainly relying on the projection method.

9. Language Education

a. Cloud-based Tuition Assistance and Evaluation System

We are developing tablet PC software as a tool to acquire six-item information about the students' everyday learning by recording with touch panel on a portable tablet. We are trying to convert the acquired information into a graph display together with utilizing the data stored in cloud networking in the hope of fostering higher scholastic results.

b. Two-way Classroom Management and Student Motivation Using Clicker

c. ESP Education: Methodology for Teaching Medical English at Aino University

We are developing a reciprocal classroom management system, in which collected data are simultaneously displayed on a screen in the classroom by responding to the button on the card terminal (response card). The result converts a one-way lecture into a two-way communication experience. We evaluate the effect of the response card to the students' learning motivation. This is the first time in Kansai Area that a reciprocal classroom management system has been applied to language classes for students majoring in the natural sciences. The initial trials received a very favorable evaluation so we are promoting further expansion of the system.

c. ESP Education: Methodology for Teaching Medical English at Aino University

The academic background of students at Aino University is relatively low compared with that of students at long-time established medical schools. The underlying cause of the discrepancy is a lack of good study habits. In addition, English is not required for national qualifying examinations so motivation to acquire a high level of English proficiency is low in the Department of Occupational Therapy. Given the present situation, we try to stimulate students' memories with visual teaching materials, which are checked with periodic classroom quizzes.

Research in the Department of Occupational Therapy is not yet in full bloom. This unfortunate situation is due to insufficient infrastructure and lack of funding. Therefore, it is imperative for the Department of Occupational Therapy to procure financial assistance for research from outside sources such as grants from the Ministry of Education and Science of Japan.

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