

Horticultural therapy in Japan*

-History, Education, Character, Assessment-

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Abstract

Horticultural therapy (HT) is defined as a process through which plants, gardening activities, and the innate closeness we all feel toward nature are used as vehicles in professionally conducted programs of therapy and rehabilitation. HT became well-known in Asian countries such as Japan, Korea, Taiwan, and China recently. Those Asian countries are faced with aged or aging societies. In Japan, HT was introduced and spread by citizens who learned or were interested in it. Awaji Landscape Planning & Horticulture Academy is a very unique academy established by Hyogo Prefecture in 1999. It has Horticultural Therapy Course which was established in 2002 after the Hanshin-Awaji Earthquake in 1995. It is the only one course in Japan to train horticultural therapists authorized by a local government. The mission of Horticultural Therapy Course is to train the experts who can heal people in need of support by means of plants, the greenery environment and gardening activities and eventually to reciprocate people's favors and assistance from all over Japan and the world.

The needs for HT are increasing little by little in many fields: medical care fields (rehabilitation hospitals, psychiatric hospitals, palliative care institutions, etc.), welfare facilities for (the elderly, people with mental disabilities, people with intellectual disabilities, etc.) and educational institutions (nursery schools, elementary schools, junior high schools, high schools, special-needs schools, etc.).

Horticultural therapists utilize the greenery environments, plants, peoples around clients. To know the characteristics of horticulture/gardening is indispensable for them.

Horticulture/gardening has some characteristics: stimulating the five senses, visible accomplishment, composed of plain actions, many chances to go outside, developing empathy. The psychological effects of HT are : (1) stress reduction, (2) regain of confidence, (3) recovery of self-affirmation (useful sense of self), (4) stimulation, preservation or recovery of mental functions etc.

The physiological or social effects of HT are: (1) prevention of disuse syndrome of body functions, (2) reduction of sensations of pain, (3) improvement/preservation of ability of body functions and for activities such as learning, execution of task, communication etc.

To gain beneficial effects on the clients, appropriate assessment is absolutely necessary. Our assessment method based on the

International Classification of Functioning, Disability, and Health (ICF) developed by the World Health Organization (WHO) and an original measure "Awaji Horticultural Therapy Assessment Sheet" (AHTAS) to capture the state of the client objectively during each HT activity are introduced.

Keyword horticultural therapy, horticulture, gardening, assessment

1. Horticulture as therapy

1.1 Brief history and definition

The first recorded use of horticulture in a treatment context occurred in ancient Egypt, when court physicians prescribed walks in palace gardens for royalty who were mentally disturbed (Lewis, 1976:4). In the 1800s, horticulture as therapy was conducted to people with mental disabilities, disadvantaged young people and mentally handicapped children in the US. During and after World War II, horticulture was adopted extensively in hospitals. Occupational therapists actively used plants and gardening activities in their therapy and rehabilitation programming.

In 1951, a horticultural program started in hospital's geriatric ward (Lewis, 1976:7). Horticulture became a kind of therapy in hospitals conducted by medical staff such as occupational therapists in the US.

Horticultural therapy (HT) is defined as a process through which plants, gardening activities, and the innate closeness we all feel toward nature are used as vehicles in professionally conducted programs of therapy and rehabilitation (Davis, 1998:3).

HT is considered to consist of three components: environment, plants and people involved (Fig.1). Environment is classified into two categories: environment with greenery and environment without greenery. The former gives clients a comfortable atmosphere. In the latter, a horticultural therapist may think of using a container garden, cut flowers or handcraft of plants etc. to make the place more comfortable. Furthermore, he/she may think how to use plants in order to make clients pleasant and to elicit or stimulate their remaining abilities. Here, plants are the objects of perception, cultivation (or use) and process. He/she may also think of utilizing people to attain clients' goal effectively. A horticultural therapist is a kind of vehicles.

His/her attitude to the clients, appearance, etc. affects them.

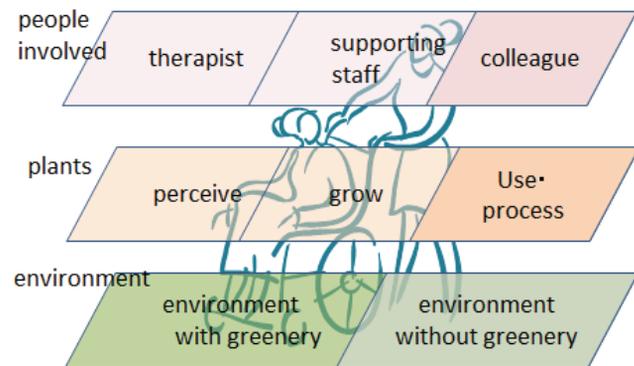


Figure 1. Structure of horticultural therapy

Supporting staff like doctors, nurses, care workers, family members, friends and colleagues in the same hospital or facility are kinds of vehicles, too. A horticultural therapist makes the best plan by combining and coordinating these vehicles effectively.

HT is adopted successfully for various groups of patients: people with physical and cognitive impairments, seniors, cancer patients, physical therapy clients, alcohol recovery clients, spinal cord and brain injury patients, people with neurological impairments, Alzheimer's and dementia groups, children, etc. Virtually, it is applicable to all patient groups.

In the 1st European COST Action 866 conference, horticultural therapy is a kind of Green care. (Hine et al., 2007:128) says that therapeutic applications of various green exercise activities and other nature based approaches such as therapeutic horticulture are effective at promoting health and well-being and by enabling healthier communities, Green care may have great potential to reduce the cost of public health.

HT became well-known in Asian countries such as Japan, Korea, Taiwan, and China recently. Those Asian countries are faced with aged or aging societies, which may be one of the reasons for attracting attention to HT in these countries.

1.2 Horticultural therapy in Japan

Historically, agriculture, horticulture and gardening have been conducted in psychiatric hospitals since the beginning of 1900. These activities had been also used for tuberculosis patients until the 1960s. Such activities were also used in hospitals for mental illness or in welfare facilities for intellectual disabilities as a kind of therapeutic activities at that time. These facts show that there had been therapeutic horticulture in the medical field and the social welfare field in Japan before introduction of HT. In contrast to institutions for tuberculosis patients, other medical and welfare institutions have been adopting horticulture and gardening activities as a kind of therapeutic recreation tools still now.

HT was introduced by three women who learned HT in the US in the early 1990s. Setsuko Grosse introduced HT of US into Japan and invited US horticultural therapists several times to hold HT workshops all over Japan. She also published many books on HT after she visited hospitals and institutions adopting HT in the US or the UK. Midori Sawada established Japan Horticultural Therapy Society in 1995. Yumiko Kan established Japan Horticultural Therapy Council in 2002 and has been taking an active part in various countries in the world.

The 1990s is the period after the bubble economy burst. Japanese people's sense of values changed greatly from material affluence to spiritual richness. The Japanese like gardening by nature and a big gardening boom came in the wake of the International Garden and Greenery Exposition held in Osaka in 1990. Around that time, European herbs and English gardens were also introduced and became popular and the number of people who enjoy gardening increased. People with various kinds of occupation came to have interest in HT. Gardening company workers, doctors / nurses / occupational therapists who had interest in gardening or alternative healthcare and teachers who were searching for effective support methods for students such as truant students, students with autism, mentally-retarded students etc. showed interest in HT. Many citizens, especially forty to fifty-year-old homemakers after child-raising who liked gardening or post-retirement people who wanted to do something for others in need of support had much interest,

too. They learned HT at the workshops or by attending HT courses opened in some colleges or associations.

Unlike in the US, it was not medical staff that introduced and spread HT in Japan. HT was introduced and spread by citizens who learned or were interested in it. The citizens who learned HT are still taking important roles as volunteers of therapeutic horticulture in the hospitals, welfare facilities for the elderly and institutions for those with intellectual disabilities. Now horticulture for health is divided into three categories: HT for people in need of support by specialists who learned HT, therapeutic horticulture for everyone's health by citizens, horticulture or gardening as an individual hobby.

In the 2000s, some private colleges established horticultural therapy courses, but a few of them still remain now. Some reasons of shakeout are thought: not so many places of employment, undeveloped educational curriculum, shortage of HT instructors who had enough experience of practical HT, etc. Today, there are one academy, two universities and some colleges where people can learn HT.

1.3 Horticultural therapy education in Awaji Landscape Planning & Horticulture Academy (ALPHA)

Awaji Landscape Planning & Horticulture Academy is a very unique academy established by Hyogo Prefecture in 1999. It has three courses: Graduate School of Landscape Planning, Lifelong Learning Course, and Horticultural Therapy Course. Horticultural Therapy Course is the only one course in Japan to train horticultural therapists authorized by a local government, which was established in 2002 after the Hanshin-Awaji Earthquake in 1995. The graduates of the course are authorized as horticultural therapists by Hyogo prefectural governor. Our prefecture got much boost from all over Japan and the world in 1995. So the mission of this course is to train the experts who can heal people in need of support by means of plants, greenery environment and gardening activities and eventually to reciprocate people's favors and assistance from all over Japan and the world.

At the beginning of Horticultural Therapy Course, the curriculum was drawn upon the core curriculum of American Horticultural Therapy Association (AHTA). It had 84 semester credits (945-hour) lectures and 1000-hour clinical internship. AHTA changed their professional registration requirements in

2008. Applicants have two options for professional registration: Option A: A baccalaureate degree in horticultural therapy and a supervised internship (480 hours). Option B: An equivalent baccalaureate degree and a supervised internship (480 hours). An equivalent baccalaureate degree is defined as a degree in a field other than horticultural therapy that includes 33 semester credits of specific required coursework. All coursework must be for college credit and must be documented through college transcripts. The required coursework may be in fulfillment of a degree or may be completed in addition to an existing

degree (American Horticultural Therapy Association, 2008).

ALPHA also started its original curriculum to train horticultural therapists in 2011. The original curriculum was made in consideration of Japanese HT conducted in hospitals, welfare facilities and educational fields. It consists of 36 semester credits (405-hour lectures) and 800-hour clinical internship (Table 1). Till 2011, there was only one course of boarding for one year. In April 2012, the commuting course for two years will start. Both courses have the same curriculum.

Table 1. Curriculum of horticultural therapy course in Awaji Landscape Planning & Horticulture Academy

(*1 period is 90 min.)

<i>AREA</i>	<i>SUBJECT</i>	<i>CONTENT OF LERNING</i>
ORIENTATION	ORIENTATION	orientation to learning
HORTICULTURAL THERAPY-RELATED (FUNDAMENTAL)	BASIC HORTICULTURAL THERAPY	characteristics of garden plants and horticultural activities, effects of horticultural therapy, understanding of clients, etc.
	PROCEDURE OF HORTICULTURAL THERAPY	process of horticultural therapy, assessment, setting goals, planning and practicing of programs, methods of recording and reporting, etc.
	HORTICULTURAL THERAPY IN MEDICAL CARE	acute-phase and convalescent-phase care in rehabilitation hospitals and psychiatric hospitals, palliative care and horticultural therapy, etc.
	HORTICULTURAL THERAPY IN LIVELIHOOD SUPPORT	convalescent-phase rehabilitation for livelihood support, vocational rehabilitation and horticultural therapy, etc.
	HORTICULTURAL THERAPY IN DEVELOPMENTAL SUPPORT	features of human developmental stage, practical use of horticulture suitable for each developmental stage, non-attending students and utilization of horticulture, etc.
HORTICULTURAL THERAPY-RELATED (APPLIED)	METHODS OF RESEARCHING HORTICULTURAL THERAPY	planning for study of horticultural therapy, statistics, physiological assessment, behavioral assessment, etc.
	EXERCISE OF HORTICULTURAL THERAPY	case-based discussion, writing a research paper, etc.
	MANAGEMENT OF HORTICULTURAL THERAPY	management of material and/or human resources related to implementing horticultural therapy, environmental management, coaching skills, etc.

(Table 1, continued)

HORTICULTURE-RELATED	BASIC HORTICULTURE —VEGETATION AND PROPERTIES OF PLANTS—	classification, features, propagation of garden plants, environmental control for growing plants, etc.
	HORTICULTURE AND ENVIRONMENT	maintenance and appropriate use of natural environment necessary for horticultural therapy, environment suitable for horticultural therapy activities, etc.
	EXERCISE OF CULTIVATION	cultivation management of flowers and vegetables, maintenance of flowerbeds, etc.
	UTILIZATION OF PLANTS IN HORTICULTURAL THERAPY	usage of various herbs, plant materials and handicrafts, flower arrangement, effective use of color, etc.
MEDICAL CARE/WELFARE-RELATED	BASIC MEDICAL TREATMENT AND NURSING CARE —DISEASES AND HEALTH—	understanding of basic technical terms used in the fields of medical care, nursing care, basic clinical psychology, etc.
	HUMAN · PLANTS · HEALTH	How has greenery been utilized for promoting human health? —history, present situation, special topics of horticultural therapy *omnibus lectures by specialists in the fields
	MEDICAL CARE AND MEDICAL SCIENCE FOR HORTICULTURAL THERAPY	basic knowledge on pathology and medical treatment of clients
	UNDERSTANDING OF CLIENTS	symptoms, pathology, mentality, support, etc. of clients
	HUMAN RELATIONS FOR HORTICULTURAL THERAPY	basic clinical psychology, psychological estimation, supporting skills,intake interview skills, etc. for horticultural therapy
HORTICULTURAL THERAPY CLINICAL TRAINING	HORTICULTURAL THERAPY CLINICAL TRAINING I (150 HOURS)	to learn assessment of those who use medical and welfare facilities, planning of horticultural therapy, preparation for therapeutic sessions and supporting methods
	HORTICULTURAL THERAPY CLINICAL TRAINING II (150 HOURS)	supervised internship to foster the ability of performing initial assessment of clients at medical and welfare facilities
	HORTICULTURAL THERAPY CLINICAL TRAINING III (500 HOURS)	supervised internship to foster the ability of implementing horticultural therapy at medical and welfare facilities

*On completing CLINICAL TRAINING II and III sessions, a case report meetings is held respectively to discuss outcomes and experiences and deepen understanding of horticultural therapy.

The number of graduates is 125 in nine years since the start of the course. Most students have experience of working before entering this course. Their occupations are nurses, occupational therapists, care workers, teachers, children's nurses, gardening company workers, etc. and forty to fifty-year-old homemakers after child-raising or post-retirement people are also included.

Their fields of activities after graduation are the medical field (Fig. 2), the elderly welfare field (Fig. 3), the educational field, gardening companies, etc. Although hospitals and welfare facilities which employ full-time horticultural therapists are increasing, the number is not so large now. So most graduates return to their previous fields and they are working as horticultural therapists with dual jobs, such as a nurse and horticultural therapist or a care worker and horticultural therapist.



Figure 2. Horticultural therapy in a rehabilitation hospital



Figure 3. Horticultural therapy for the elderly

The managers of hospitals or welfare facilities who think HT is effective for their clients or users are increasing. But horticultural therapists are not medical therapists with national qualifications, so they are not allowed to do medical care like doctors, nurses or occupational therapists. One of the factors that limit the expansion of job opportunities for horticultural therapists might be the fact that no medical treatment fee is paid for HT by nation. On the other hand, as the needs for HT in welfare facilities are increasing, part-time horticultural therapists are increasing, too.

Approximately 20 years after introduction of HT into Japan, HT became popular to some extent. Although the needs for HT are increasing little by little in many fields such as medical care fields (rehabilitation hospitals, psychiatric hospitals, palliative care institutions, etc.), welfare facilities for (the elderly, people with mental disabilities, people with intellectual disabilities, etc.) and educational institutions (nursery schools, elementary schools, junior high schools, high schools, special-needs schools, etc.), full-time horticultural therapists are fewer than workers combining with horticultural therapists and part-time ones.

2. Characteristics and effects of horticulture

2.1 Characteristics of horticulture / gardening

There are many characteristics in horticulture / gardening. This section is focusing on them from the viewpoint of health.

2.1.1 Stimulating the five senses

It is known that views of nature have positive, physiological impacts on individuals whether or not they are consciously aware of them. These effects include lower blood pressure, reduced muscle tension, and lower skin conductance (Relf, 1998:27). Plants which the client feels comfortable are used in HT. The color, shape, smell, touch and taste of plants, sounds of wind/ water/ insects/ birds and conversation with others stimulate the sensory organs, attract people and make them comfortable (Fig. 4). It is also believed that touching plants with beauty and good fragrance and doing gardening activities which the client feels comfortable lead to stress reduction in HT.

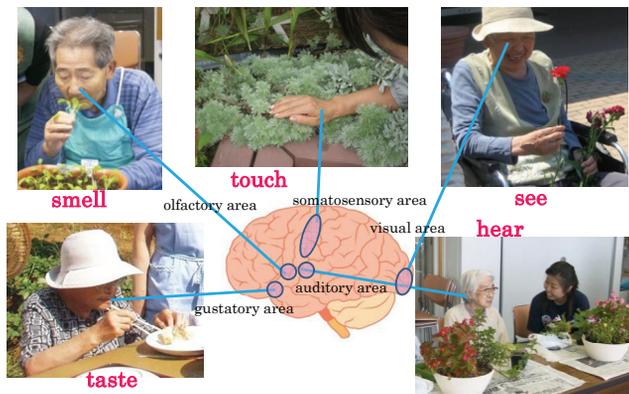


Figure 4. Stimulation of five senses in horticultural therapy

Selection of plants is based on safety of the material and the environmental conditions for cultivation. In addition, the following plants are selected: plants which easily elicit the client's interest and are combined with his/her memory, plants which cause the sense of season, annual flowers and vegetables whose growth is fast, and plants the client prefers.

2.1.2 Visible accomplishment

It is said that decision-making is conducted by a man based on reward. Gardening is accompanied by germination, flowering and fruition after sowing or planting seedlings. Sometimes making a handicraft using plants is conducted in HT. These activities are so easy to understand visually that the rewards and results can be imaged soon. Because of this, gardening is suitable for conducting goal-oriented activities and easily leads to a highly-motivated action (Fig. 5). Horticulture is a meaningful, purposeful activity that is motivating, normal, and tangible (Haller, 2006:10).

Even in the gardening work description, there is no need to explain the work in language only. Showing the motion of work enables the client to understand what he/she should do. This means that the tasks are easily recognized visually. Gardening provides good motivation for people with the declined memory function and/or reduced ability of undertaking tasks, patients with mental disorder who are in depression state, and people with intellectual disabilities who are not good at linguistic information processing. In gardening activities, such people can work with a sense of self-affirmation maintained.



Figure 5. Visible accomplishment in horticultural activities

2.1.3 Composed of plain actions

Many of the gardening work consist of a combination of plain motions. This shows that it is easy to find the process which even people with disabilities can do or find out the points to be assisted. The majority of tasks are easily adaptable to accommodate the abilities and challenges of diverse individuals (Haller, 2006:15). This means that anyone can participate in the agricultural and horticultural activities, and that they can become a barrier-free place for everyone.

2.1.4 Many chances to go outside

That gardening becomes a part of everyday life has many meanings. One of them is that it helps to motivate the clients to go outside on a daily basis to see flowers and vegetables they are growing. The opportunities to do the activities of daily living such as getting up, dressing themselves and moving arise from this motivation. In addition, it is said to be good for stabilizing Circadian rhythm, autonomic nerves, and the immune function to be out in the sunlight.

2.1.5 Developing empathy

It was mentioned above that the environment, plants, people are the basic elements in HT. Plants, which are objects of gardening, are familiar for us all and the topics concerning them, e.g. the names, color, shape, anticipation for growth and fun of harvesting are acceptable for everyone. Such plants can successfully bring people empathic conversation and smile. Opportunities to communicate through the

gardening like this will lead to enhancing motivation for life and self-affirmation. As horticultural activities have the potential to be highly effective means for improving social interaction (Haller, 2006:10), they might be also effective in practicing rebuilding the human relationships.

2.2 Effects of horticultural therapy

Many effects of HT are known empirically although most of them have not been verified yet. This section is focusing on various effects of horticultural therapy.

2.2.1 Psychological effects

The psychological effects of HT are: (1) stress reduction, (2) regain of confidence, (3) recovery of self-affirmation (useful sense of self), (4) stimulation, preservation or recovery of mental functions. Mental functions, as listed in ICF, include orientation functions (orientation to time, place, person, etc.), energy and drive functions, attention functions (sustaining, dividing and shifting attention), memory functions, emotional functions, perceptual functions, thought functions, higher-level cognitive functions, mental functions of language, mental function of sequencing complex movements and experience of self and time functions.

We are researching stress reduction after horticultural activities by analyzing some stress markers in saliva. As extraction of saliva is not invasive, it is suitable for validating the change of psychological stress before and after horticultural activities.

2.2.2 Physiological effects

The physiological effects of HT are: (1) prevention of disuse syndrome of seeing functions / hearing and vestibular functions / taste function / smell function / proprioceptive function / touch function / sensory functions related to temperature / functions of the cardiovascular system / immunological system functions / other body functions, (2) reduction of sensations of pain, (3) preservation of neuromusculoskeletal and movement-related functions and preservation of activities of daily living, (4) improvement / preservation of mobility, (5) improvement / preservation of ability of changing and maintaining body position, (6) improvement / preservation of ability of carrying, moving and handling objects, (7) improvement / preservation of ability of walking and moving, (8) improvement / preservation of ability

of self-care such as washing oneself, dressing, eating, drinking, looking after one's health.

2.2.3 Social effects

The Social effects of HT are improvement/preservation of abilities of: (1) purposeful sensory experiences such as watching, listening and other purposeful sensing, (2) basic learning such as copying, rehearsing and acquiring skills, (3) applying knowledge such as focusing attention, thinking, solving problems and making decisions, (4) conducting general tasks and demands such as undertaking a single task, undertaking multiple tasks and handling stress and other psychological demands, (5) communication, (6) interpersonal interactions and relationships, etc.

3. Understanding of clients and evaluation

Pre-intervention assessment, grasp of healthy functions and abilities of the client, detection of problems to solve, reasonable goal setting, programs for goal achievement and appropriate support during the activities are indispensable in order to perform HT effectively. In this chapter, assessment for depicting the whole image of the client is focused on in particular. The perspective to capture the whole picture of the client is useful and applicable to the therapeutic design of environment as well as HT.

3.1 Initial assessment and International Classification of Functioning, Disability, and Health (ICF)

HT has the following procedure: Assessment - Setting goals - Planning of HT programs - Execution of HT - Evaluation of goals (Fig. 6). Horticultural therapists review whether the HT goals were suitable for the client and whether the HT goals have been fully attained in a fixed period. So the procedure of HT just mentioned is repeated till the final goals are achieved.

In HT, it is one of the most important things to know about the clients. When we see a client, we are apt to make a judgment by appearance or with prejudice. So we need some kind of methods to take an objective view. This thought would apply to therapeutic horticulture. In the HT field, we could not find

any standard assessment methods. That was a big problem. If the results of assessment were different by each horticultural therapist, the goals and care plans would be different and satisfactory results would not be expected. So we developed one initial assessment method (Toyoda, Yamane, 2008) drawn upon International Classification of Functioning, Disability and Health (ICF).

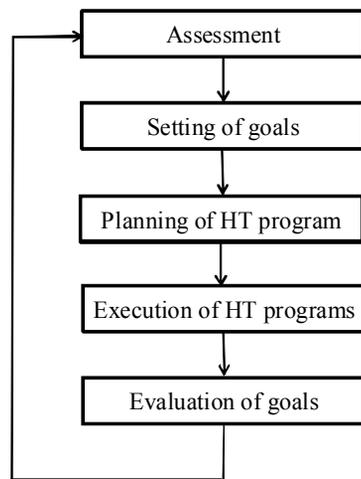


Figure 6. Procedure of horticultural therapy

ICF is a classification of health and health-related domains developed by the World Health Organization (WHO) in 2001. ICF describes functioning from three perspectives: body, person and societal. ICF organizes information in two parts. The first part deals with "Functioning and Disability" and the second part covers 'contextual factors'.

Components of "Functioning and Disability" are: (1) 'Body component' including body functions and body structures. A problem in body functions or structure is noted as 'Impairments', (2) 'Activity' and 'Participation' components. 'Activity' is defined as execution component of a task or action by an individual and 'Participation' as involvement in a life situation. A difficulty at the personal level would be noted as an 'activity limitation', and at the societal level, as a 'participation restriction'. Components of Contextual factors are independent and integral of the classification and are divided into : (1) 'Environmental factors' and (2) 'Personal factors'. 'Environmental factors' have an impact on all components of functioning and disability but 'Personal

factors' are not classified in the ICF. These factors have interactive relationships.

By using ICF, people in charge of medical care or nursing care etc. will be able to have common understanding of the same client one another. But there are over 1,500 categories in ICF, so it is difficult to select necessary and appropriate items for the initial assessment in HT. So Toyoda and Yamane (2008) selected the essential items and modified some categories grounded on the distinguishing features of HT and the initial assessment in the past research reports on HT in Japan. Here, the component, "subjective aspects" was newly added. This factor reflects the personal views of the clients. Although such a component is not included in ICF, we thought it was essential in HT aiming at clients' stress reduction or motivation improvement. The essential categories for HT assessment based on ICF are showed in Table1.

An example of the initial assessment by using ICF is as follows: Take a case of an elderly female aged 80 with moderate dementia whose memory function is declining. Her health condition is described as 'Alzheimer's disease'. In terms of mental functions, the memory function is declining but the perceptual function is maintained at the level of her age. In terms of motor functions, she can walk by herself. In terms of activities, some assistance is required in dressing, bathing and toileting. Meals are self-supporting. As for participation, she tends to be absent from the opportunities to enjoy conversation with others and recreation. The environment around her changed: she moved from home to a special nursing home and accordingly, caregivers changed from her family members to the care workers. Concerning subjective aspects, the client frequently gets irritated and her self-confidence and motivation for life are declining because she cannot do so many things by herself as she wishes. These states are shown in Fig. 7.

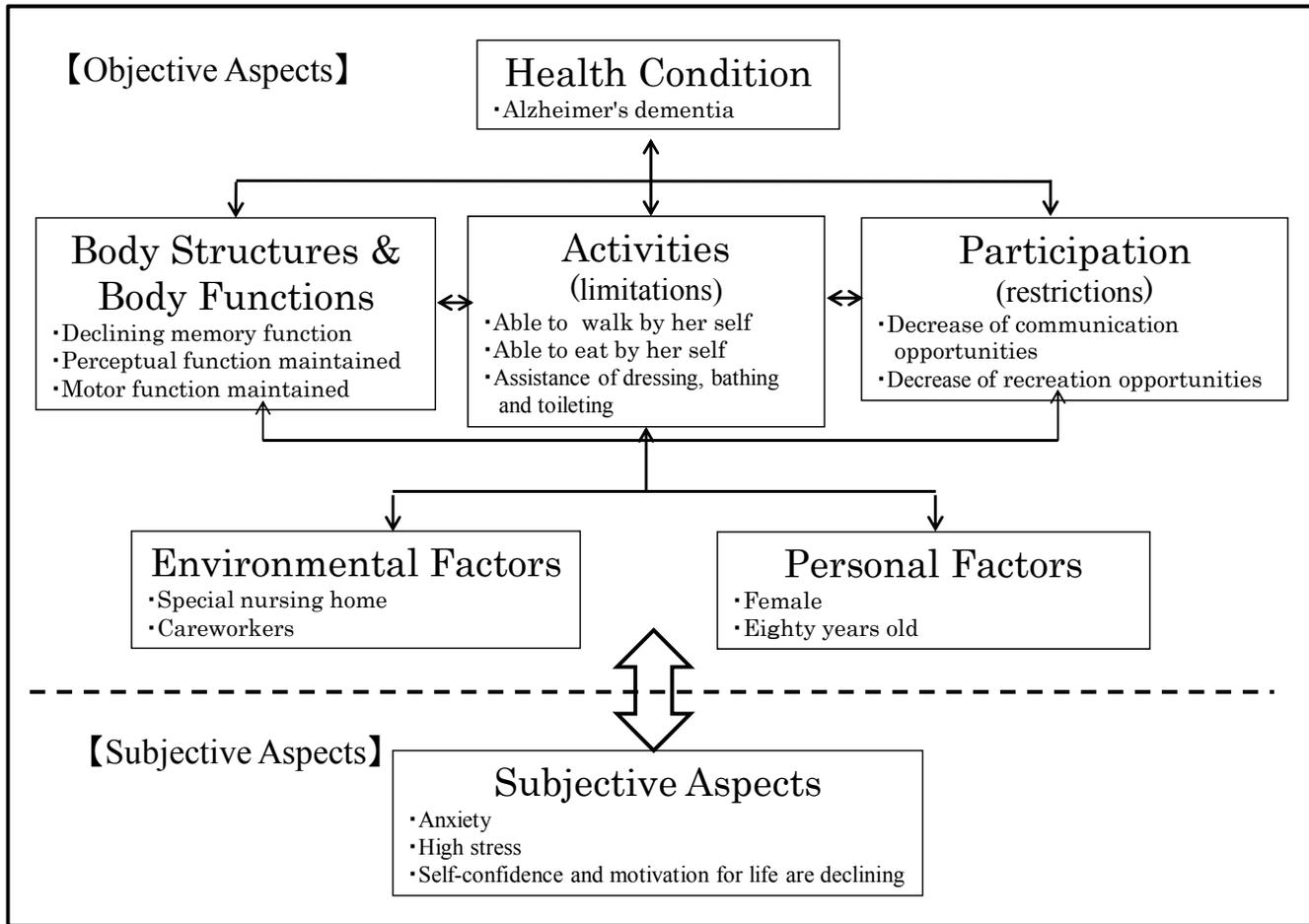


Figure 7. An example of comprehensive assessment of a person with an Alzheimer's dementia —interaction of ICF components with subjective aspects—

In this case, the goals would be: reduction of anxiety and stress, maintaining activities of daily living, suppressing cognitive decline, maintaining the quality of life, feeling the joy in everyday life, eliciting the remaining functions, etc. Based on personal experiences, preferences and the ability of the current mental and physical capabilities, a horticultural therapist provides the environment where the client can feel at ease and work safely and considers the program the client can continually enjoy. As for the activities, the therapist makes approaches to stimulate the client's declining functions and elicit the remaining features by using plants which bring comfortable stimulations through the senses and providing fun programs the client join on her own motive. In brief, use of an ICF-based assessment enables us to consider solutions through a complete picture of the client, without focusing only on the disease called Alzheimer's disease. In other words, some changes will arise in activities and environmental factors by bringing the gardening activities into a daily life. They will reduce anxiety and stress, subjective aspects. Furthermore, continual implementation of programs stimulates the client's mental functions, leads to prevention from disuse of healthy functions and promotes recovery of motivation for life and sense of self-affirmation.

To sum up, to figure out the client from overall viewpoints — health condition, mind and body functions, activities and participation, environmental factors, personal factors, etc. — makes it easier to find the relationship between problems and keys to solve them. Horticultural therapists who graduated from ALPHA mastered this initial assessment method and can use it in their work.

3.2 Use of existing measurement and original evaluation

Assessment using ICF is conducted through observation, interviews, trial gardening work, etc. Such assessment is adequate to depict the state of the client but does not represent the mind and body functions and the activity level objectively in numerical terms. So we select and use some appropriate scales for capturing the state of the client among existing ones such as Mini Mental State Examination with respect to the cognitive function, Barthel Index, FIM a measure of ADL as for the activity level and QOL-D a measure of QOL for dementia, Vitality Index concerning subjective aspects of the client. These scales are classified into two types: one is the observation type and the other is

the questionnaire type. The former is selected when the client cannot answer or has difficulty in answering the questions. In case he/she can answer the questions and the answer is reliable, the latter is used.

Furthermore, in order to evaluate the degree of attainment of the HT goal, original evaluation scales were sometimes devised, for example, 'applied behavior analysis' (Nakatsuka, et al. 2012) and 'transition of dietary intake of the client' (Yokota, et al. 2012).

3.3 Assessment during horticultural therapy activities

A measure is also required to capture the state of the client objectively during each HT activity. Toyoda (2008) developed Awaji Horticultural Therapy Assessment Sheet (AHTAS). It consists of ten check items of four levels; three items for evaluating 'affections' (1: motivation, 6: expectation, 10: satisfaction), six items for 'mental functions' (2: orientation to time, 3: dividing attention, 4: short-term memory, 5: long-term memory, 7: judgment, 8: achievement of tasks) and one item for 'communication ability' (9: communication) (Table 2).

In most cases, a horticultural therapist pays attention to low score items in AHTAS if the client has potential for recovery of his/her function. In some cases, a therapist conversely pays attention to high score ones to prompt the client to use the remained faculties.

A horticultural therapist can make a judgment comprehensively whether HT goals have been attained or not by comparing the results of existing measure based assessment before and after HT intervention and from the scores of AHTAS in each program.

Table 2. Awaji Horticultural Therapy Assessment Sheet (AHTAS)

No.	item	standpoint	criteria
1	Motivation	Attitudes	3 : show enough spontaneity and positivity 2 : show some spontaneity 1 : participate through passive 0 : just looking
2	Orientation to time	Cognition of season, month and / or date	3 : be cognizant of date or day of the week 2 : be cognizant of month 1 : be able to recognize season when some topics concerned are provided 0 : be unable to recognize season, month and date even if some topics concerned are provided
3	Dividing attention	Conversation in a group or performance of task requiring more than one attention	3 : be able to have a normal conversation in a group / be able to perform a task requiring more than one attention 2 : be able to remark and / or indicate his / her intention in answer to the words of people around / be able to perform a task requiring more than one attention to some extent 1 : just listening to others' words / be able to perform a task requiring more than one attention a little 0 : not participate / be scarcely able to perform a task requiring more than one attention
4	Short-term memory	Memory within a few minutes	3 : be able to remember 2 : be able to remember to some degree (mostly able to do) 1 : be able to remember a little (mostly unable to do) 0 : be unable to remember
5	Long-time memory	Memory more than a few minutes ago -episodic memory or procedural memory-	3 : talk very much / be able to remember very much / be able to recall of procedural memory 2 : talk much / be able to remember much 1 : talk a little / be able to remember a little 0 : not talk / be unable to remember
6	Thinking (expectation)	Sense of expectation for growth / harvest of crop and / or next activities etc.	3 : expectation coming out of client's own accord 2 : expectation coming out and interest increasing with support 1 : expectation coming out with support but low interest 0 : expectation not coming out even if some support is provided
7	Higher-level cognitive functions (judgment)	Judgment	3 : be able to decide with hesitation 2 : be able to decide though hesitating 1 : be unable to decide in a muddle 0 : reject / be fully dependent on a supporter
8	Carrying out tasks undertaking tasks	Activities	3 : be able to carry out by himself / herself (without support) 2 : be able to carry out some support 1 : give up halfway 0 : not work
9	Communication	Conversation (= verbal) and / or body gestures (= nonverbal)	3 : enough utterance / indication of intention / understanding others 2 : a certain degree of utterance / indication of intention / understanding others 1 : answer questions asked by a supporter 0 : not answer questions asked by a supporter
10	Satisfaction	Expression, movement, way of talking	3 : show much pleasure 2 : show a little pleasure 1 : seem to be somewhat dissatisfied 0 : seem to be dissatisfied

4. Therapeutic design and horticultural therapy

HT is an emerging profession in the modern society. The importance of maintaining relationship with nature to keep human health good is the most basic theory in HT.

Agriculture, horticulture and landscaping are the activities which link human living to nature. Benefits for human health included in agriculture / horticulture / landscape were originally utilized in occupational therapy. Later HT became independent from occupational therapy and became one of the complementary and alternative medicine. This process of development of HT could be said to be 'intra-disciplinary'. But, the second stage of development began when it became independent from occupational therapy. HT has been taking in many theories and techniques from related areas and improving to meet to the needs of each society in each country. This process of transmuting could be said to be 'cross-disciplinary' aspect of HT (Fig.8).

In conclusion, I would like to consider the current situation of Taiwan. The greenery environment gives people much stimulation and elicits many capabilities. This relationship between humans and plants is helpful to keep all people healthy. But, in fact, there are many people who have a few chances to contact with greenery. Many people may be unaware of the comfortable stimulation of plants. And there may be many people who have difficulties in enjoying themselves in such environment.

Since the 1980s, the need for elderly care services has been increasing with deficiency of the home caring capacity in Taiwan (Chuang, 2008). Privatization of social welfare is required and nonprofit organizations going into elderly care services have been increasing gradually. Under such situation, care prevention of the elderly and differentiation of care services seem to be required.

Therapeutic gardens might be a good solution. Gardening would be helpful for care prevention for the elderly, too. But the number of people who can go to therapeutic gardens or enjoy gardening by themselves is limited. People with disabilities or dementia may be eliminated, if caregivers do not know that horticulture is useful for such people. So the knowledge for taking care of them by means of horticulture or therapeutic gardens will be needed. It is the most important to train not only experts of HT but also many citizens who

know how to utilize horticulture or therapeutic gardens in elderly care. ALPHA has a brief course for citizens to learn horticultural therapy or therapeutic horticulture. Most of the students who finish the course are playing a role in supporting horticultural therapy / therapeutic horticulture as volunteers at nursing homes, taking care of their folks or promoting regional activities. The educational system like this might be required in the near future in Taiwan. Citizens in the aged / aging society are required to play a role as facilitators who can elicit various abilities from elderly people by means of the greenery environment and/or gardening.

Horticultural therapists can give citizens the knowledge of HT and show how to take care of the elderly with disabilities or dementia through HT. The purposeful and sustainable integration of the greenery environment, horticulture and people will be of great value for humans' society facing with aging issues or stress issues.

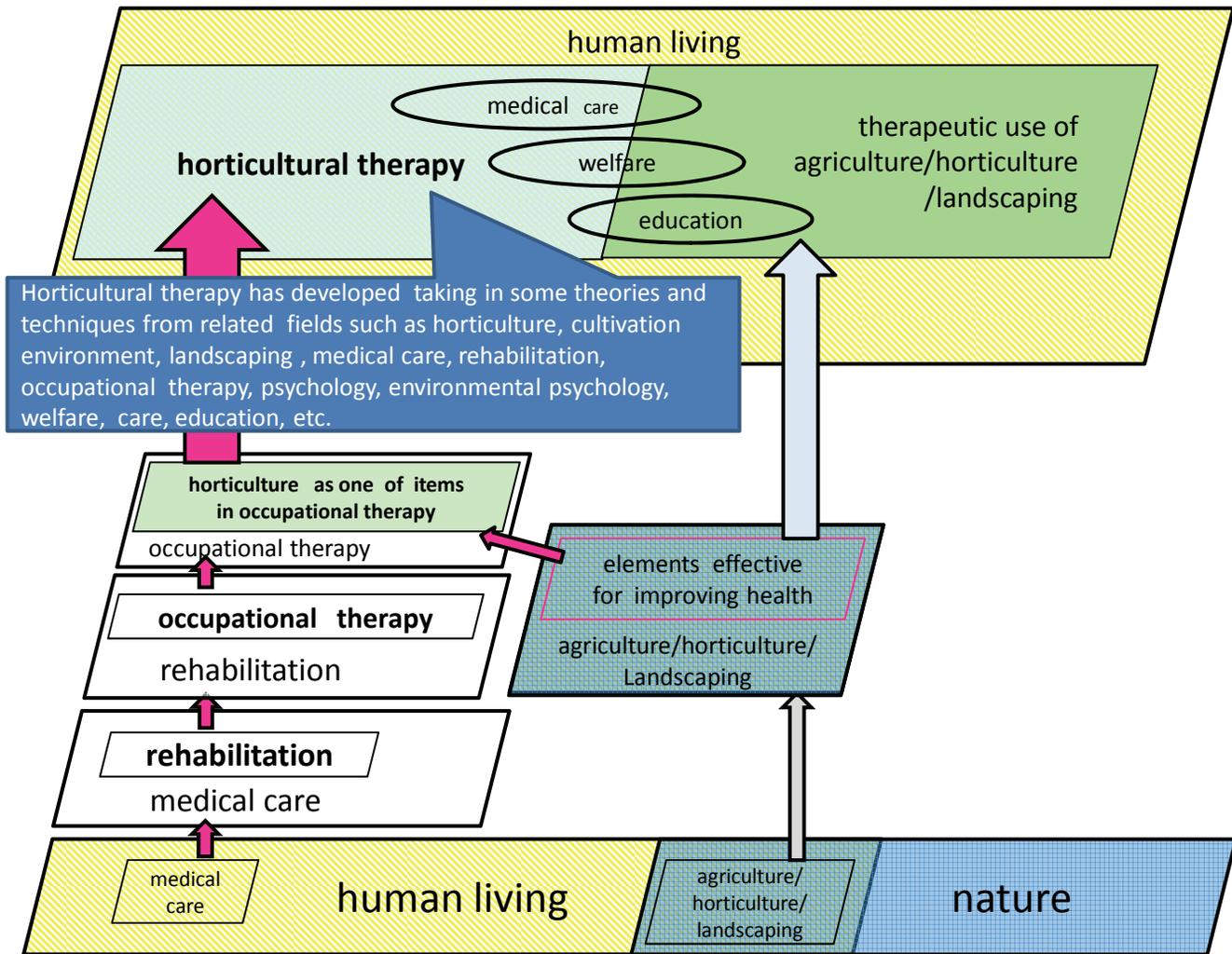


Figure 8. Positioning of Horticultural Therapy

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