Assistive Technologies for People with Dementia: Personal Review

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Chapter 6 Reminiscence Therapy and ICT

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6.1 Review of Reminiscence Therapy

Memories are our own private episodes, formed from an individual person's experiences in the past. Talking together on the pasts means exchanging a part of their egos. As a result, people are able to prompt mutual understanding. Therefore, memory has a role of building and maintaining human relationships. Reminiscence is "a process in which individuals attempt to accept negative events of the past, resolve past conflicts, reconcile the discrepancy between ideal and reality, identify a pattern of continuity between past and present and worth in life as it was lived" (Thompson, 2013).

Reminiscence intervention is one of the approaches suggested in order to increase feelings of positive self-esteem and psychosocial well-being, and to decrease behavioral disturbances (Yasuda, Kuwahara, Abe et al., 2009). The act of reminiscence is critical to successful aging, as it helps to form identity and build problem-solving skills (Thompson, 2013). Yamasaki, Izumi, & Nakatani (2012) provide a trigger for recollection by presenting social events and information similar to the lost memory.

Despite experiencing degeneration of short-term memory function, people with dementia can very often retain a facility for long term memory. Reminiscence therapy is a proven means of stimulating long-term memory to prompt communication in people with dementia (Gowans, Campbell, Alm et al., 2004).

Current practice often relies upon physical props, e.g. old photo-albums, audio tapes, CD/DVDs, videos etc. (Gowans, Campbell, Alm et al., 2004). Media content ranged from generic content to personal photographs; the predominant media type was music. Other content types were based on the era or region in which the individual with dementia grew up or were based on personal interest. The use of a "reminiscence kit" include a portable selection, such as old toys, smells, maps, and food, and technological triggers, such as slides or records. (Lazar, Hilaire Thompson et al., 2014).

Reminiscence Therapy and Life Review (Lazar, Hilaire Thompson et al., 2014): Reminiscence methods were introduced in dementia care over 20 years ago and have taken a variety of forms. Reminiscence Therapy involves the discussion of past activities and events with other persons, usually with the aid of tangible prompts such as photographs, daily life items, music and archived sound recordings. Life Review is another method for use in reminiscence processes that typically involves individual sessions, in which the participants are guided chronologically through life experiences, encouraged to evaluate them, and possibly to produce a life story book.

Evaluations: Fletcher, & Eckberg (2014) explored the effects of creative reminiscence activities on the quality of life of clients. They showed significant increases in caregivers' perceptions of their loved ones' quality of life and decreases in the burdens during the intervention phase. The Cochrane review concluded that there are many promising indications of the effect of reminiscence work on quality of life and reduced depression, but due the small size and relatively low quality of the few studies done, it is difficult to make a robust conclusion yet.

Photo Using Reminiscence Therapy: The various studies on reminiscence therapy suggests the use of photographs such as scents, foods and music. Some interventions used songs and the sharing of photographs that correlated with the weekly "theme", and encouraged the family members of participants to join in. The use of props can be used to add structure to the group therapy session, as each member can take turns. This structure was taken to another level by limiting the group to photos pre-selected by the therapist, which may not have allowed participants to explore the memories important to them as individuals (Thompson, 2013).

The interest album is the collection of pictures with some large-print words about a single, favorite topic or activity can provide many hours of engagement. Interest albums can be made using magazine pictures, photographs of familiar and personal objects, and mementos and memorabilia, such as baseball or other sports, a doll collection, wine, fishing, music, theatre, reading, TV shows, movies/actors, gardening, shopping birds, favorite trips, and so forth (Bourgeois, 2007).

Photographs hold a variety of types of information such as date and time, place, and events. People have a tendency to promote their bonding by confirming the shared experiences and photographs provide an opportunity to start a conversation about shared memories of the family (Yamasaki, Izumi, & Nakatani, 2012).

However, such photographs are often too small for senior citizens to see clearly. Typically, such photographs have been pasted into albums. The albums are usually bulky and heavy, and thus not easy to handle. In addition, individuals themselves or caregivers need to turn the pages to browse through the albums. If these photos were turned into a video slideshow, enlarged photos could be seen on a TV monitor without having to turn album pages (Yasuda, Kuwabara, Kuwahara et al., 2009).

Problems of Reminiscence Therapy: In contrast to the positive results of integrative and instrumental reminiscence, poor physical and mental health, lower life satisfaction and higher distress was found amongst older adults who participated in obsessive or escapist reminiscence, such as intimacy maintenance and bitterness revival. (Thompson, 2013). A potential area of discomfort that may arise from reminiscence therapy is the reaction to disturbing photographs, such as wartime photographs or of deceased loved ones (Lazar, Hilaire, Thompson et al., 2014).

Reminiscence Therapy by Utilizing Tools: People with dementia have few means of enjoyment. Picture gramophones have buttons with the names and/or symbols of songs which the person with dementia used to enjoy singing. Pressing the button starts the music (ENABLE, 2004). The *Musical Memory Lane* built in a 1930s radio cabinet and the "*Video Memory*

Lane" housed in a 1950s television cabinet present nostalgic music and videos to people with Alzheimer's disease in an easy-to-access, push-button, picture format (Alzheimer's society, 2015).

6.2 Review of Reminiscence Therapy by Utilizing ICT

Reminiscence Therapy Supported by ICT: The use of multimedia in Reminiscence Systems (RS) was in the growth of research supported by ICT, and there are a significant number of research projects and publications highlighting such work. It is natural, perhaps that reminiscing work, which uses visual and hearing senses could be enriched with multimedia material encompassing photographs, videos, audio recordings, music as well as historical material from newspapers (Mulvenna, Zheng, & Wright, 2009).

Using multimedia, the RS can animate the material thus making it more attractive and attention holding than a paper-based scrapbook. However, since the process of creating a memory book is itself a process rich in reminiscing opportunities, care must be taken not to replace this type of work with a more mundane and less user-centered multimedia authoring process. Arguably the next opportunity in RS research and development is the potential for the Internet to create new ways for reminiscing to be supported (Mulvenna, Zheng, & Wright, 2009). Despite its effectiveness, regular reminiscence intervention is difficult to perform, especially at home, due to a shortage of human resources. Therefore, convenient, home-oriented reminiscence interventions are important (Yasuda, Kuwahara, Abe et al., 2009).

Subramaniam and Woods (2010) reviewed key issues in relation to reminiscence work with people with dementia and presents the findings of a systematic review of original studies on information and communication technology reminiscence systems and dementia published since 2000. Most systems comprise primarily personalized biographical materials, and these could be seen as a replacement for a life story book. A few systems comprise more general material and would lend themselves as memory triggers to enhancing conversation in small groups, or in pairs with care workers.

Information and communication technologies (ICT) are potential venues for supporting the reminiscence therapy. Lazar, Thompson, & Demiris (2014) systematically examines the scientific literature on the use of ICT for facilitating RT to assess the current state of the evidence and identify future trends. ICT has the potential to be a practical way to support the delivery of RT, whether through permitting individuals to stay in their local communities while communicating with others at a distance.

Eight papers described systems that utilize ICT for reminiscence therapy but did not report any evaluation with the target population. The projects used diverse types of technology: to deliver reminiscence therapy remotely, to capture and display daily activities, to play multimedia, to monitor brainwaves of an individual during reminiscence therapy. Several of the projects used a touch screen interface to allow people with dementia to manipulate the reminiscence materials. One example is the Computer Interactive Reminiscence and Conversation Aid (CIRCA) group, who found that the touch screen interface encouraged users with dementia to use the system themselves with little prompting (Lazar, Thompson, & Demiris, 2014).

Two projects gathered materials from the users' daily activities using technology, such as GPS, cameras, and audio recorders, to compensate for memory deficits during reminiscence. The motivation for one design was to alleviate caregiver strain originating from repeatedly providing details to help someone with dementia recall facts about events during casual reminiscence. Yasuda, Kuwabara, Kuwahara, Abe et al., (2009) used photographs, background music, narration, panning, and zooming in its reminiscence video slideshows (Lazar, Thompson, & Demiris, 2014).

One study found that generic photographs prompted more storytelling from individuals with dementia (Astell, Ellis, Alm et al., 2010) and noted the potential for emotional distress when a person with dementia fails to recognize himself or herself or others in personal photographs. Another study found that people showed more interest and less distraction while viewing personalized photo-videos than while viewing TV shows (Yasuda et al., 2009). One explanation for the disparity in findings is that the first group of researchers had people with dementia involved in conversation, possibly resulting in the person with dementia struggling to

remember specific details about pictures from his or her past. The second study took place with a person with dementia alone in a room viewing photo-videos. By not requiring the participants to generate conversation with another party, the researchers might have enabled the participants to enjoy the personalized photo-videos. Another explanation is that the different findings are due to the higher score on the Mini- Mental State Examination (MMSE) of participants in the first study, possibly leading to more awareness of their difficulty in recalling information and subsequent discomfort (Lazar, Thompson, & Demiris, 2014).

Reminiscence therapy can be time-intensive and costly in terms of preparation and delivery. Technology can also bridge geographic distance and address transportation barriers. A potential area for technology to aid in the delivery of reminiscence therapy is in allowing the digital transfer of materials for reminiscence therapy to the therapist. A website-hosted reminiscence intervention was built that allowed family members to upload personal material to be viewed by their relative with dementia (Lazar, Hilaire Thompson, & Demiris, 2014).

The football reminiscence project consisted of four interventions in different locations that used digitized images from a historic football picture database for reminiscence therapy with older males with dementia. The set of papers dealing with **networked reminiscence therapy** describes a system focused on the delivery of therapy from afar. The system is designed to allow a caretaker or therapist to view videos and photos with an individual in another location. Evaluations of this system have found that most individuals find remote reminiscence therapy enjoyable, and some have had persisting benefits in terms of managing behavioral symptoms, such as anxiety, irritability, and restlessness (Kuwahara, Yasuda, Tetsutani et al., 2010; Yasuda, Kuwahara, Kuwabara et al., 2013; Yasuda, Kuwahara, & Morimoto, 2009). Yasuda et al., (2013) involved in networked reminiscence therapy addressed this concern by setting up the system in the participants' homes and remotely starting applications (Lazar, Thompson, & Demiris (2014).

Future studies should be more descriptive in how reminiscence therapy is delivered. Another issue is that results were rarely separated by dementia severity, despite the differences in people across the spectrum of disease. If researchers include individuals at different stages of dementia (Yasuda et al., 2013), they should separate results by stage or specify if there is no difference (Lazar, Thompson, & Demiris, 2014).

Despite their limitations, the papers included in this review yield some rich insights on benefits and challenges of using ICT during reminiscence therapy. Challenges include that many of the systems require technical expertise for setup or operation and may not be ready for independent use by family caregivers. Benefits include the enjoyment derived by people with dementia from viewing reminiscing materials through various forms of multimedia, such as video and audio (Lazar, Thompson, & Demiris, 2014).

The purpose of Tuan and Ko (2014) is to design a talking life memories album. When each page in this album is turned, a recorded voice is broadcast that explains the individuals in the photo. With voice interaction technology, the elderly can leave recordings for future. Generations about nostalgic photos, and they can also record their memories in their own voice. Light-dependent resistor (LDR) is used as the switch to trigger voice-interaction on or off. When the LDR is triggered, it automatically searches the corresponding voice zone with microprocessors in real time. The elderly were greatly impressed by the voice-interaction concept. In addition, most of the test subjects were enthusiastic about the do-it-yourself capacity, which allows them to decide the content of the album themselves.

Talking photo albums have become popular gifts for seniors with and without memory challenges. Fried-Oken and Rowland (2008) asked whether adding one- to two-word spoken output to pictures and text would enhance language use and conversation. Results clearly demonstrated that AAC devices with digitized voice output depressed conversational performance and distracted participants with moderate AD as compared to similar devices without voice output. It could be argued that the very presence of voice output produces perceptual and attention problems that interfere with the use of an external device for conversation. For a number of participants, the novelty of the voice output caused them to stop conversing. Some clients who could verbally embellish a point found that the spoken cue interfered with conversation (Bourgeois et al., 2010).

Photographs are useful for recalling memories of happy past days and promoting bonding of family through communication of shared happiness. However, it is difficult for persons with dementia to recall a detailed memory just by looking the registered information of the photograph. Furthermore, the family caregiver may not always remember the event shown in the photograph. Therefore, as information to aid memory recollection, the system shows another photograph registered with similar information or associated social events. The content in the social events database stores effective information for recollection, such as social events which occurred during the same period or information associated with the dementia patient's hobby (Yamasaki, Izumi, & Nakatani, 2012)

Review of Lifelog: Many researchers are trying to address this concept by logging the life of a person, recording daily activities and making them available in reminiscence processes later on. Aggregation of audiovisual media, and sensor data such as location and temperature, makes it possible to create an overview of the activities of a day. Utilizing aggregated data from a GPS logger and a digital camera can provide technological support for episodic memory to aid persons in storytelling and reminiscence activities. It features a personal memory organizer which uses images, sounds, and recorded text, to help recall names, faces, conversations and other important information. Studies have also been done to explore the feasibility of using images from the innovative SenseCam device in conjunction with sensor data as a life-logging approach (Hallberg, Kikhia, Bengtsson et al., 2010).

Hallberg, Kikhia, Bengtsson et al., (2010) aims to show the viability of a semi-automated tool for supporting reminiscence and at the same time building up a media-rich life-log, as a useful basis for integrated services for persons with dementia. It presents and discusses a reminiscence process which aim to build and maintain episodic memories of everyday life. This reminiscence process is part of a larger system, called **Memory Lane**, which will also provide real time support based on this life-log, using context reasoning and context correlation. A person with mild dementia can learn by rehearsing details about the day, and hence build lasting episodic memories. However, this remains to be properly tested. By helping persons with mild dementia build lasting episodic memory and by providing real time support through the MemoryLane mobile device we hope to promote independent living for persons suffering from mild dementia.

The typical approach for reminiscence processes in the studies mentioned above is to use wearable devices which can capture and collect data during the day of a person (mobile device, camera, GPS logger, etc). The data is then typically transferred to a local storage where it is aggregated and analyzed to form a life log (Hallberg, Kikhia, Bengtsson et al, 2010).

The Microsoft SenseCam, a device that takes photographs at intervals was wore by a person with early-stage dementia. A therapist then used the photographs during RT. The individual was not able to remember that he had been wearing the SenseCam and was confused about where the pictures had come from but was able to engage in richer conversation than without the photographs as prompts (Lazar, Thompson, & Demiris, 2014).

Privacy and Lifelog: There are important privacy issues related to the use of automatic recording devices in daily life. Hallberg, Kikhia, Bengtsson et al., (2010) intend to investigate this delicate ethical balance during field tests. Furthermore, users of life-logging systems must have the option to turn off recording temporarily, in sensitive situations. A key challenge is how to make this explicit act easy enough to be remembered by users who usually have trouble remembering and performing procedures. Persons with more severe dementia will no longer be capable of using this option, leading to a strong requirement for ensuring confidentiality of recordings and other identifiable personal data.

6.3 Talking Video

For pleasant activities for Alzheimer's patients, almost all of them require caregiver supervision. Among pleasant activities, watching TV has many attractive features for individuals with dementia. It is convenient, readily available, and does not usually require caregiver supervision. However, not all TV programs effectively sustain patients' attention or provide enjoyment. Moreover, in the course of time, dementia is often accompanied by deterioration of language ability, making it difficult to comprehend the

conversation on TV programs, as well as conversation in daily living (Yasuda, Kuwabara, Kuwahara et al., 2009).

As an alternative to TV programs, videos for people with dementia are currently available. Most of these videos include singing old songs and showing old customs, annual events, cooking, and so on. In a generic videotape series called "video respite", created for the use of individuals with dementia, video narrators talk in calm, friendly tones about activities such as gardening, family events, gatherings at Christmas, and singing old songs (Yasuda, Kuwabara, Kuwahara et al., 2009).

Therapeutic benefits of *Video Respite* let people with Alzheimer's disease enjoy the interaction. This highly engaging video series provides opportunities for singing, movement, and conversation for viewers in moderate to advanced stages of Alzheimer's disease and related disorders. These programs are proven to calm agitation and reduce self-limiting behaviors. Flexible enough to be used almost anywhere a television or videotape player is available, the videos are perfect for a variety of settings, including adult day centers, clinics, hospitals, support group meetings, long-term care facilities, and even home use (Lund et al., 1995). Yasuda et al. (2006a) created "Talk Video" for such individuals, in which a woman talks about such topics as hometowns and old customs and sings old songs. Yasuda et al. also developed a conversation-support system that consists of three electronic resources: a vocabulary data file, an encyclopedia, and Internet homepages (2007a). DVDs on the market can also be used as additional contents, such as short movies depicting traditional foods and events or social documentaries (Yasuda, 2006b). This system has been converted into a remote conversation system (Aye, 2008).

6.4 Reminiscence Video

Yasuda (2007) created two such generic videos. One problem with group reminiscence intervention or generic video use is that personal preference is often not considered. It is difficult to predict which generic themes will engage a person in a reminiscence session. Furthermore, individuals with dementia develop semantic amnesia that causes an inability to recall generic memories such as public events, traditional practices, common knowledge, and so on (Yasuda, Kuwabara, Kuwahara, Abe, & Tetsutani, 2009).

Despite its effectiveness, regular reminiscence intervention is difficult to perform, especially at home, due to a shortage of human resources. Therefore, convenient, home-oriented reminiscence interventions are important. As individuals, we are inevitably more concerned with ourselves and our own autobiographies than generic episodes. Individuals with dementia also show a clear desire for items of personal relevance in reminiscence intervention (Alm et al., 2004). Their autobiographical memories, especially of younger times, are often preserved. Although individuals in advanced stages of dementia cannot voluntarily recall autobiographical memories, proper stimuli such as old photos and retold episodes may help them recall their "old days" (Yasuda et al., 2009). Technology would create a DVD that stores and plays the patient's biography (Willis & Price, 2014). Cohen (2000) developed *video biographies* that included interviews with family members, photographs and favorite stories. Cohen's research found that agitation was reduced in patients with Alzheimer's disease after viewing the video biography, because it filled the need for social contact, and that these feelings tended to carry over.

Personalized Reminiscence Photo Videos (Yasuda et al., 2009): Each video contains about two hundred personal photos and lasts nearly an hour. It is accompanied by songs and a short, welcoming commentary. They developed a video slideshow based solely on the old photographs of individuals (Kuwahara, Kuwabara, Abe et al., 2005; Yasuda, Nakamura, & Kuwabara, 2005). They call this video a *personalized reminiscence photo video*" (photo video). To make the interaction more engaging, a pan/zoom effect was added to the photo video. Since old music and children's songs are effective for calming individuals with dementia (Yasuda et al., 2006a), such music is played in the background to increase the enjoyment of the individuals with dementia.

The narration was made by a female narrator in her 30s who was asked to speak slowly and gently in short sentences of less than about five words. Since individuals with dementia often lack correct autobiographical memories, in order to not induce stress from difficulty of recalling memories, open-ended questions were avoided, such as "Where was this photograph taken?", "Who is sitting next to you?". Instead, the narrator frequently praised the subjects in the photographs, saying for example, "You look beautiful", and "Your dress is very nice", or the narrator made confirmative descriptive statements, such as "They are eating a

delicious meal", "You are surrounded by many flowers".

Photo videos will help caregivers perform reminiscence intervention at patients' homes or institutions. It can also be viewed repeatedly with or without caregiver attendance. While individuals with dementia are enjoying the video, behavioral disturbances are not expected to occur, thus giving caregivers some respite.

Yasuda et al. (2005) and Kuwahara et al. (2005) performed preliminary studies on the effectiveness of the photo video. The effectiveness of photo vide was evaluated in comparison with two types of TV shows: a variety show and a news show.

These results confirmed that photo videos are effective in helping individuals with dementia focus their concentration for a substantial period of time. Moreover, the results suggest that the photo video may be effective for individuals, especially with moderate and severe dementia, whereas the TV news show seemed to be less effective for maintaining concentration for subjects with moderate and severe dementia, and the TV variety show, for subjects with severe dementia. Comparison of the concentration scores for the first photo video with that of the second photo video indicates that the mild group subjects showed poor concentration for the second photo video presentation. Our interpretation is that they remembered the photos in the first presentation and were bored by seeing the same photos 30 minutes later.

The moderate and severe group subjects showed concentration scores for the second photo video that were much higher than those shown by the mild group subjects. Probably this was because the moderate and severe group subjects did not remember the photos in the first presentation. The moderate group's distraction scores, compared to those of the mild group, increased for the TV news show but not for the variety show. This suggests that the TV variety show may be much easier for them to understand and enjoy than the news show.

The severe group subjects' distraction scores increased considerably for the TV variety show, compared to those of the mild and moderate group subjects. This suggests that these severe patients already have difficulty enjoying even the TV variety show (Lund et al., 1995). The photo video appears to be an appropriate method to attract the attention of these severe group subjects.

Three subjects were unable to finish watching the shows. Subjects 5 and 8 quit the experiment due to a sense of uneasiness and worry, and subject 10 showed little interest in his photo video.

Some individuals such as subjects 4 and 14 gave extensive oral responses to the narrations or photos. Their interactions seemed like real dialogue. In an earlier study (Kuwahara et al., 2005), it was shown that some children also enjoyed conversation with their dementia-afflicted parents while watching the photo video together. Thus, the video may work as a prompter of verbal communication for some individuals.

Our photo video combined four factors: accessing preserved memory of a younger age through photos, playing background music of old tunes, narrating in an encouraging manner, and using pan/zoom visual effects. The multiple impacts of these factors can be summarized by a caregiver's comment (Kuwahara et al., 2005): "I showed her old photograph albums on several occasions. She did not look at the albums very long, but she enjoyed this photo video for several hours. This video met my expectations."

Recent Researches on Reminiscence Video (Thompson, 2013): Baecker, Marziali, Chatland et al. (2006) seek to impact psychosocially the entire ecosystem encompassing AD individual, family, and caregiver, and evaluate the intervention's impact over a period of six months after completion of the biography. Biographies are structured as a series of "acts" which typically represent major stages of one's life such as adolescence, a first marriage, or the birth and first years of a child. Within each act there are a number of "scenes". Still photos, video clips, music.

Regular viewings of a visual biography serve to stimulate memories and bring joy to the AD individual. The biographies provide benefits to family members such as better remembering. The biographies also seem to stimulate conversations between the AD individual and family members, and to enable third-party caregivers to better understand who is in their care and thereby approach caregiving with greater knowledge and empathy.

The multimedia biography tells the story of the life of an elderly person with a cognitive impairment. Using a production process

in which they collaborated with family caregivers, Smith, Crete-Nishihata, Damianakis et al. (2009) share lessons learned from the multimedia biography research to assist practitioners, families, or researchers who wish to use similar technologies and processes for eliciting and sharing life stories.

Remote Reminiscence Therapy: Communication, especially verbal, is an easy, common, and enjoyable activity for most of us. Individuals with dementia, however, tend to be alone and poorly informed with few chances to talk. One of the most important interventions in *networked interaction therapy* is to provide them with conversation partners on the Internet, such as friends and family members living in remote locations. A simple interface enables individuals with dementia to talk with partners by video phone whenever they want.

It is important to verify that they can converse eagerly and sufficiently for certain durations by video phone and in face-to-face sessions. Yasuda, Kuwahara, Abe, and Tetsutani (Yasuda, 2006) revealed no differences in the total response time and in the eagerness observed between the two sessions, suggesting that video phone talking could potentially have the same effects as face-to-face conversation. The researches discussed so far suggest that a combination of video phone and reminiscence interventions would be effective for psychological stability. Kuwahara et al. (2007) created a system to incorporate video phone and reminiscence photo sharing and conducted an experiment of this system's effectiveness in an institution for senior citizens (Kuwahara, Yasuda, Tetsutani et al., 2010).

Kuwahara et al. (2010) focused on the effect of reminiscence and previously proposed a networked interaction therapy to provide such communicative intervention as talking on video phones, offering private reminiscence contents, and managing daily schedules by TV monitors (Kuwahara et al., 2004). Based on this concept, they developed reminiscence systems that consist of reminiscence video and remote reminiscence conversation systems to calm individuals with dementia and to relieve the burden of family caregivers.

However, no reports exist using video phones to assist individuals with dementia living at home, because, compared with care facilities, providing such service to people with dementia at home is more difficult. The experimental was setup of the patients at home. As preparation for remote reminiscence conversations, the subjects and caregivers submitted old photos that were digitized on the terminal PC.

Remote reminiscence conversation was effective for Subjects 2 and 4 in terms of psychological stability. Since Subject 4 sometime became anxious in the evening, remote conversation in the evening stabilized her and provided a break for her caregiver. Our system might prevent such syndromes as wandering in the evening, agitation, etc. Furthermore, Subject 4 was even stable three hours after the conversation. This may be the most valuable finding of this experiment and for future research. For Subject 1, there was no difference in psychological stability between watching TV and remote conversation. Her dementia was mild, so she could still enjoy ordinary TV programs. This might explain why there was no difference in the psychological stability.

Despite its effectiveness, reminiscence therapy is difficult to perform at home because such sessions are usually conducted in a group led by experienced staff at institutions with such items as old tools, toys, photos, and paintings. The reminiscence conversation system might overcome such difficulties. Combining with our schedule prompter system will enhance the effectiveness of ICT utilization for supporting individuals with dementia and their family caregivers at home.

6.5 Simple Reminiscence Video

Since creating such personal reminiscence photo videos is very time-consuming (Yasuda, 2006b). Yasuda, Abe, and Kuwahara (2006b) developed a simple system for making photo videos by connecting a digital video camera to a TV set with an integrated VCR function. With this system, the photo video can be made on the spot without needing to be edited. To further improve photo video production, Kuwahara et al. (2005) developed a computer-implemented authoring tool that semi-automatically creates a photo video with narration and music. By using these methods, the photo video can be made at a lower cost and with less labor. Moreover, this will allow many individuals with dementia to enjoy reminiscing about old videos in their home or institution setting.

6.6 Group Reminiscence Therapy

The personalized Monogram Booklet slideshow is presented via a laptop computer. Each of six slides has a personal photo, a short phrase starting with the first letter of the participant's name, and a voice recording of the short phrase. The Monogram Booklet slideshow is customized using personal photos, a familiar voice, and short phrases that bring together a meaningful moment via sight and sound. With the written and spoken photo explanation, a participant is more likely to get through the slideshow without interruption (Spivey, 2011).

Some research suggests that the reminiscence photo activities that include voice input can be distracting to participants, especially those with moderate Alzheimer's disease, when compared to reminiscence photo activities with no sound. The participant's focus becomes more fixated on the sound than the purpose of the activity as a whole. After each slideshow, if the group starts no conversation, the facilitator can begin with open-ended questions. For example: "Do these photos remind you of anything?" (Spivey, 2011)

Otake (2009) proposed novel method named ***coimagination***. Participants of the co-imagination program bring three images according to the topics of the session in order to share imagination and communicate with them. Each participant has five minutes for talk and five minutes for questions. Number of participants is six, so that one session lasts for one hour. Themes include "favorite things", "neighborhoods, hometown and travels", etc. Selecting photos stimulates planning abilities, and conversation about them develops communication skills.

A group reminiscence approach (GRA) with reality orientation (RO) is widely used as a psychosocial intervention for dementia. Akanuma, Meguro, Meguro et al. (2011) studied 24 patients with vascular dementia. Since glucose metabolism is associated with brain function, cerebral glucose metabolism was measured by positron emission tomography (PET). PET demonstrated that metabolism in the anterior cingulate was increased in the GRA-RO, whereas no significant changes were observed in the control. These results suggest that GRA-RO stimulates the anterior cingulate and has a positive effect on social interaction.

6.7 Summary

Reminiscence intervention is one of the approaches suggested in order to increase feelings of positive self-esteem and psychosocial well-being, and to decrease behavioral disturbances. Reminiscence intervention exploits the fact that long-term memory is usually preserved even after short-term memory is impaired (Yasuda et al., 2009). Reminiscing requires prompts aimed at stimulating feelings and memories e.g. the use of audio and visual triggers to stimulate recall. Researches demonstrated how it was valuable and beneficial to person with dementia. Inconclusive evidence was found for the efficacy of reminiscence therapy for dementia in a Cochrane Review. Reminiscence in general, but especially life reviews are potentially effective methods for the enhancement of psychological wellbeing in older adults (Carswella et al., 2009).

There was no evidence that the use of general reminiscence materials was associated with psychosocial benefits. The use of life story books and multimedia alternatives, with or without an associated life review process, does appear to be worth pursuing from both clinical and research perspectives (Subramaniam, & Woods, 2012).

In terms of social media, existing social networking sites such as Facebook can support reminiscing interactions using specialized applications or "apps." There are also emerging social network sites that cater specifically to older people. It is unclear if they support specific reminiscing activities, but a part of their attraction is in bringing older people together in a social network and supporting their interactions. While not explicitly supporting reminiscing, some sites are a social networking application that is strongly orientated to linking family members in support of sharing experiences (Mulvenna, Doyle1, Wright et al., 2011).

We believe that there are three main modalities of use for reminiscence systems. Firstly, the use of a reminiscence system by an individual; secondly, more than one person sharing reminiscences in the same physical space; and thirdly, shared reminiscing where people are physically remote from each other but inter-connected by the Internet (Astell et al. 2010b).

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