

Original Article**Changes in subjective Quality of Life after making a Daruma doll and recreation in elderly patients with dementia**

**Keiko Tsuchiya, OTR, PhD,¹ Yuri Kanayama, OTR, PhD,¹ Kenichi Ono, OTR, PhD,¹
Kenichi Kobara, RPT, PhD,¹ Tomoshige Koga, PhD¹**

¹Department of Rehabilitation, Faculty of Health Science and Technology, Kawasaki University of Medical Welfare, Kurashiki, Okayama, Japan

ABSTRACT

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Objective: As a part of a day-care rehabilitation program, we conducted table work and recreational activities with elderly patients with dementia once a week for 12 weeks. We examined the influence of the differences in the contents and process of the activities on the subjective QOL of the patients.

Methods: We used a modified version of the Affect Rating Scale (ARS) to measure the changes in subjective QOL, before and after performing the task. Subsequently, we compared the rates of each change.

Results: The contents of table work were different in each session. The rate of change in ARS scores was significantly high after the 3rd session of table work using red *washi*, which was made with traditional methods of Japan, compared with those after the 5th and 6th sessions. The recreational activity was the same throughout the study. The 1st and 2nd trials showed a slight difference, which was lower than that observed in the 3rd to 6th session.

Conclusion: Each activity related to table work may have influenced the rate of change. However, the rate of change in the recreational activity remained the same after it peaked. Thus, the characteristics of each activity influenced the subjective QOL of the elderly patients.

Key words: Elderly patients with dementia, Subjective Quality of Life (QOL), Activities at table, Recreation

Introduction

The Ministry of Health, Labour and Welfare announced that, by 2025, the number of elderly people with dementia will reach 7 million [1], which is about one fifth of the population of those aged 65 and above. Therefore, practitioners in the field of rehabilitation will have more patients because cases of dementia are not only complicated in the maintenance phase, but also in the acute and convalescence phases.

Many theses describe the importance of QOL with reference to the rehabilitation of elderly people with dementia [2, 3].

Lawton [4] defined dementia-related QOL as the “existence of positive affect and deficiency of negative affect.” Similarly, Kuroda et al [5] and Homma [6] reported that affect, particularly positive affect, is the most important index of subjective QOL for elderly people with dementia.

Ann [7] examined the effect of recreation on QOL in elderly patients with dementia. She reported that when physical, cognitive, and socio-psychological recreation was practiced for 12 days on patients with less excitement and willingness, their positive affect and willingness improved, while their negative feelings decreased.

Sugiura [8] conducted some recreational activities such as the scissors-paper-rock game or counting games with 22 middle-aged men and women and compared their emotions before and after the activities. He found that their negative moods decreased and their positive feelings increased.

As described above, several studies have examined the subjective QOL of elderly people with dementia, using recreational activities or games. However, not many have addressed activities related to table work (e.g. manual labor, painting, or drawing) [9].

Kawakubo et al [10] tried drawing therapy 12 times on 5 elderly patients with moderate level dementia. They found it effective in improving the Behavioral and Psychological Symptoms of Dementia (BPSD) and psychological stability.

Correspondence: Keiko Tsuchiya, OTR, PhD
Department of Rehabilitation, Faculty of Health Science and Technology, Kawasaki University of Medical Welfare, 288 Matsushima, Kurashiki, Okayama 701-0193, Japan.
E-mail: tsuchiya@mw.kawasaki-m.ac.jp
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However, many such reports solely refer to improvements in cognitive functions and BPSD, and few have focused on subjective QOL.

Therefore, we examined the influence of different activities on the subjective QOL of dementia patients in a day-care rehabilitation program. We did this by conducting some manual table work and recreational activities, once a week, over 12 consecutive weeks.

We aimed to clarify the characteristics of these two different categories of activities and to provide guidelines for designing activities for elderly people with dementia.

Methods

1) Subjects

Eleven elderly women participating in a day-care rehabilitation program offered through a private hospital were included. Their average age was 87.8 ± 4.6 years and the average score on the revised

form of the Hasegawa's Dementia Scale (HDS-R) was 13.5 ± 3.3 at the commencement of the study. Sample characteristics are presented in Table 1.

The aims and methods of the study were explained to the subjects and their families, and the study was conducted after securing their permission and willingness to participate voluntarily.

2) Procedure

The research plan is shown in Fig. 1.

The table work activities included Daruma doll making (Fig. 2) and recreational activities included some games.

<Contents of Daruma doll making and games>

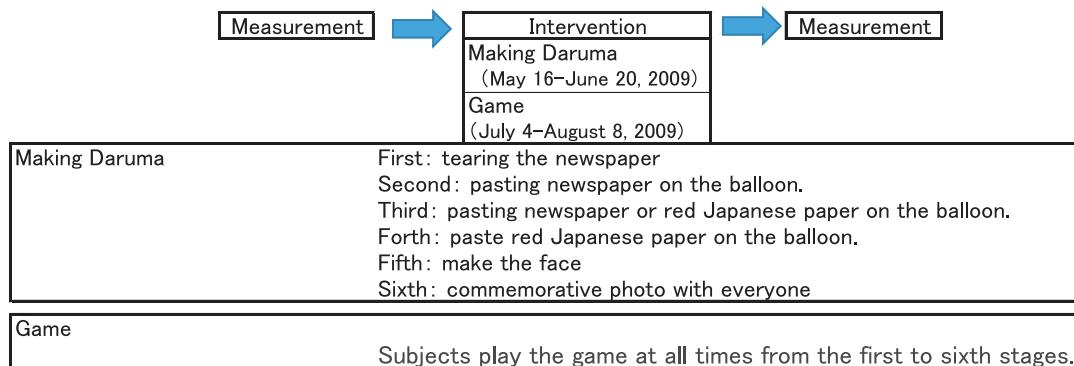
The doll-making activity was conducted 6 times from May 16, 2009 to June 20, 2009, every Saturday, from 11:00 to 11:30 a.m.

In the 1st session, participants were shown a completed doll and explained the process of the work. This was followed by tearing an old newspaper into

Table 1. Basic Attributes of Each Subject.

	Age	Dominant hand	Caregiving needs	HDS-R	Disease
1	93	Rt.	Long-term care level 2	16	Cerebrovascular dementia, Cerebral infarction, DM, OA of the knee
2	88	Rt.	Long-term care level 1	11	Cerebrovascular dementia, OA of the knee
3	92	Rt.	Long-term care level 2	10	DAT
4	86	Rt.	Long-term care level 2	14	Cerebrovascular dementia, CF
5	91	Rt.	Long-term care level 1	15	Cerebrovascular dementia, OA of the spine
6	85	Rt.	Long-term care level 3	13	DAT, Lumbar compression fracture
7	88	Rt.	Long-term care level 1	18	Cerebrovascular dementia, Renal damage
8	78	Rt.	Long-term care level 3	19	Cerebrovascular dementia, Osteoporosis
9	83	Rt.	Long-term care level 3	13	Cerebrovascular dementia, Spondylolysis
10	89	Rt.	Long-term care level 2	12	DAT, OA of the spine
11	93	Rt.	Long-term care level 2	8	DAT, OA of the knee

HDS-R (Hasegawa's Dementia Scale), DM (Diabetes Mellitus), OA (Osteoarthritis), CF (Cardiac Failure), DAT (Dementia of Alzheimer type)



We measured HDS-R and NM scale on May 16 and August 8.

Figure 1. Conceptual Diagram of Measurement Procedure of Modified ARS, HDS-R, NM scale, in each time at day-care rehabilitation.



Figure 2. The completed Daruma.

smaller pieces. In the 2nd session, they pasted 5 to 6 layers of the pieces of paper onto a swollen balloon.

They continued the same task in the 3rd session. On completing it, they prepared pieces of red *washi* paper to be glued over the balloon.

In the 4th session, almost all the patients were engaged in covering the balloon with the pieces of red *washi* paper.

The 5th session entailed pasting a piece of white *washi* paper, about the size of a face, onto the balloon, painting eyes and a nose, and applying other decorations. Several patients asked their operational therapy teachers for help during this task.

In the 6th session, they assembled to have memento pictures taken holding their own completed Daruma dolls.

After the table work activity, games were played 6 times, for 30 minutes each, from July 4, 2009 to August 8, 2009. The patients were divided into 2 groups, and were seated on chairs or wheelchairs arranged in a line, the 2 groups facing each other. The program of the games included 1) confirmation of the date, 2) limbering up, 3) a hockey game, and 4) doing exercises to singing.

Limbering up included exercises for limbs and fingers or making shapes with fingers. In the hockey game, with paper sticks, the 2 teams attempted to score by carrying a ball to the goal. In the exercises to singing, they were encouraged to move their limbs and fingers.

In the doll-making activity and games, the tools and materials were always placed at different locations unfamiliar to the patients. Further, 2 new staff assisted them with their wheel chairs or activities.

<Evaluation>

The evaluations were conducted on the first and last day of intervention, i.e., on May 16, 2009 and August 8, 2009, respectively. We used the HDS-R to evaluate cognitive functions and the N-type psychological condition scale for the elderly (NM) to evaluate

behavioral observation of daily life.

We also used the modified Affect Rating Scale (ARS) on the days before and after the doll-making activity and games were conducted, to evaluate the patients' subjective QOL (Table 2).

<The modified ARS>

The modified ARS is a revised version of the Philadelphia Geriatric Center Affect Rating Scale by Lawton [11]. It is designed to evaluate affect, an aspect of QOL of elderly people with dementia.

It entails a five-degree evaluation of three positive emotions such as joy, interest, and satisfaction, and of three negative emotions such as anger, fear and anxiety, and depression and sorrow, based on a 20-minute observation for each factor.

Each factor is scored as follows:

- 0 points for "impossible to evaluate," "none," and "dozing."
- 1 point if the emotion is exhibited for less than 16 seconds.
- 2 points if the emotion is exhibited for 16 seconds to less than 1 minute.
- 3 points if the emotion is exhibited for more a minute to less than 5 minutes.
- 4 points if the emotion is exhibited for 5 minutes to less than 10 minutes.
- 5 points if the emotion is exhibited for over 10 minutes.

Additionally, each factor is evaluated as (+) for positive affect and (-) for negative affect. The points for each factor are added up to generate the total. The total points on the Altered ARS range between -15 and +15. Higher scores are indicative of higher subjective QOL. A high score on QOL is indicative of good reliance between the subject and the other party [12].

3) Statistical analysis

We used the Wilcoxon rank sum test to compare the HDS-R and NM scores before the doll-making activity and games, and to compare pre- and post-intervention scores.

We first calculated the rate of change in the modified ARS score for each session of doll making and games. We used the following procedure: (the score on the modified ARS at the end of the doll making sessions and games)-(the score before conducting the activities) / (the index before beginning the activities). The resultant score was then multiplied by 100.

Subsequently, we compared the rate of change in the score on the modified ARS for the doll-making activity and games, using the Wilcoxon rank sum test. The significance threshold was .05, while a cutoff of .10 was considered to indicate a tendency for significance.

Results

There was no difference in the modified ARS score for the doll-making activity and games before the

Table 2. Modified ARS.

	0	1 (0~16sec)	2 (16~59sec)	3 (1~5min)	4 (5~10min)	5 (over10min)
Joy						
Signs:	1 smiling 2 laughing 3 stroking or gently touching other 4 nodding 5 singing 6 touching each other 7 reaching out warmly to each other					
Interest						
Signs:	1 eyes following objects 2 maintain eye contact: eyes following objects or person 3 responding by moving or saying something 4 maintain eye contact 5 responding to music by moving or saying something 6 responding to person or object by body movement					
Satisfaction						
Signs:	1 relaxed posture: sitting or lying 2 relaxing look 3 gentle behavior					
Anger						
Signs:	1 clenching teeth 2 scowling 3 yelling 4 cursing 5 berating 6 pushing away 7 shaking fist 8 pursuing lips 9 narrowing eyes 10 drawing eyebrows together; making distancing gesture					
Anxiety/Fear						
Signs:	1 lines across forehead 2 fidgeting 3 repeated or agitated movement 4 fearful and frustrated look 5 sighing 6 isolated from other people 7 tremors 8 tight facial muscles 9 crying frequently 10 hand wringing 11restless legs					
Depression/Sadness						
Signs:	1 crying 2 shedding tears 3 moaning 4 drooping face 5 face expressionless 6 wiping eyes					

0: Impossible to evaluate. None. Doozing.

intervention, as well as the score on the HDS-R and NM scales before and after the intervention (Table 3).

The mean scores for each session of the doll-making activity and those before and after each game have been presented in Table 4, and the mean rate of change in Table 5.

A comparison between the rates of change in each session of the doll-making activity revealed that the rates were significantly higher for the session, as compared to the 5th ($p = 0.03$) and the 6th ($p = 0.005$)

sessions. Further, the score for the 4th session was higher than that for the 6th ($p = 0.03$), and that for the 5th was higher than that for the 6th ($p = 0.028$). The score for the 4th session seemed higher than that for the 5th session ($p = 0.091$). No differences were observed among the other sessions.

A comparison of the rates of change in each of the games revealed that the rates were significantly lower for the 1st session as compared to that for the 3rd ($p = 0.005$), 4th ($p = 0.005$), 5th ($p = 0.028$) and 6th

Table 3. Scores of HDS-R and NM scale before and after all interventions.

	Scores of HDS-R		Scores of NM scale	
	before intervention	after intervention	before intervention	after intervention
1	18	21	48	45
2	17	20	35	33
3	15	13	23	25
4	15	15	33	31
5	14	16	28	31
6	14	14	23	23
7	13	15	29	29
8	12	13	25	25
9	14	17	29	25
10	10	8	35	31
11	6	6	25	23
AV	13.5	14.4	30.3	29.2
SD	3.3	4.5	7.3	6.4

AV: Average SD: Standard deviation

Table 4. Average of Modified ARS's Scores for Making Daruma and Game.

	First		Second		Third		Fourth		Fifth		Sixth	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Daruma	4.7±3.5	5.5±6.5	8.1±3.1	10.2±6.8	5.6±3.5	9.1±2.5	6.9±4.2	10.5±3.8	4.2±3.3	5.6±4.3	7.1±4.7	4.4±4.1
Game	6.7±5.4	6.6±5.1	4.5±5.8	5.6±5.24	3.2±7.6	11.5±2.9	0.9±3.8	8.3±2.0	2.9±5.2	8.4±6.7	3.8±3.5	11.4±4.4

Table 5. Average of Rate of Change for Making Daruma and Game's Scores.

	First	Second	Third	Fourth	Fifth	Sixth
Daruma	14.2±104.6	14.5±150.4	156.7±241.9	100.3±103.1	38.6±89.6	35.5±39.8
Game	11.2±71.2	17.6±69.8	319.8±466.1	350.7±326.1	234.2±442.5	248.9±165.4

($p = 0.018$). The rates were significantly lower for the second session as compared to the 3rd ($p = 0.022$) and 6th ($p = 0.018$) sessions, and tended to be lower than that for the 4th ($p = 0.070$) and 5th ($p = 0.086$) sessions. No other differences were observed.

A comparison of the rates of change for each session of games and doll-making activity revealed no difference among the first 3 sessions. However, the rates were significantly higher for the games as compared to that for the doll-making activity at the 4th ($p = 0.016$) and 6th ($p = 0.000$) sessions. Further, the rate of change also tended to be higher for the 5th session ($p = 0.095$). No other differences were observed.

Discussion

There was no difference in the scores on the modified ARS for the games and doll-making activity

before the intervention. Findings indicate that the effect of the doll-making activity, which preceded the games, on the subjective QOL, did not last for the 2 weeks after which the games began. Therefore, it seems safe to conclude that the doll-making activity did not influence the games.

1) The Daruma doll-making activity

Comparing the rates of change for each session of this activity, we found that there were no significant differences between the 1st and 2nd sessions, and average values of modified ARS's score in the 1st and 2nd intervention (making of the Daruma doll) were low compared to the other sessions. This indicates that the first 2 attempts at doll making did not arouse the subjects' positive affect, such as joy, interest, and contentment.

Karino [13] suggested that elderly people with dementia would gain relief, comfort, and support from

their familiar relationships and environment [14].

In this regard, our patients participated in the activities with new staff, and performed unfamiliar tasks. Therefore, they might have taken time to get used to their new environment. This suggests that the doll-making activity may not have worked effectively in decreasing their negative affect like depression [15].

However, the rate of change for the 3rd sessions was significantly different from that for the 4th, and it was significantly higher than that for the 5th and 6th sessions. Participants started using red *washi* paper from the 3rd session. It seems that the color of the red paper had effectively influenced the patients. Studies have reported that the cognitive function of color perception, the most emotionally sensitive aspect of visual perception, declines slowly, and that favorite colors have a positive influence on the mental and physical functions of patients [9].

The appearance of “red” on the worktable may have excited affect through cognitive function, such as joy and pleasure, and enhanced the rate of change.

The rate of change was lower in the 5th session as compared to the 3rd, and tended to be lower than that in the 4th session. The 5th session required the participants to cut out the shape of a face from white *washi* paper, paint eyes and nose, and apply decorations on the face. During this task, many subjects relied on their occupational therapists for help.

As Leslie [16] noted, painting or drawing are often resisted by elderly people. Cutting out the shape of a face from the paper, pasting it on the Daruma doll, and painting eyes and a nose on it required the subjects to be careful and delicate, which would have caused them to have a negative affect toward the activity, leading to a decline in the rate of change. Moreover, the rate of change for the 6th session was in negative figures, which was evidently lower than the rate for the 3rd, 4th and 5th sessions. In the 6th session, the subjects took memento pictures holding the dolls they had created.

Tessa [17] suggests that those with dementia often have an experience in such activities as “I am just here,” because it is difficult for them to understand the meaning and purpose of such activities.

Thus, in the present study, the subjects might not have enjoyed taking memento pictures as an indicator of completing the work. They might have rather considered it as not being free or being tied down.

2) The games

Similar to the Daruma doll-making activity, the rate of change was low in the first 2 sessions of games, marking no clear differences. The rate of change for the 3rd session was significantly higher than that for the 1st and 2nd sessions. Further, no difference was observed among the 3rd, 4th, 5th, and 6th sessions. Kamitani [18] reported that happy events are predominantly remembered as episodic memories.

We thought that the repetition of the same game had provided a familiar atmosphere, which the patients related to, through the joy of the game, enough to be memorized as happy occasions. This may have resulted in the higher positive affect after the game, from the 3rd session onward. Indeed, this was 1 session earlier than the doll-making activity.

The games included singing, exercising, and playing a hockey-like game.

Ann [19] reported a decrease in BPSD in elderly people with dementia, after participation in physical and cognitive recreational games.

Sakamoto and some others [20] reported that the introduction of music therapy worked well on the cognition and affect of patients with dementia.

Our games included elements such as music, and physical and cognitive activities, which would have caused a multiplier effect, arousing positive affect in the patients. Further, positive memories of the games would have led to the higher rate of change.

3) Comparing the rates of change between the Daruma doll-making activity and games

There were no significant differences in the rate of change for the first 3 sessions of the doll-making activity and games. This lack of difference may imply that the elderly patients with dementia needed few sessions to be familiarized with the table work activity of Daruma doll making, as well as the games.

However, the rates of change for the 4th, 5th, and 6th sessions of the games were higher than those of the doll-making activity. We suppose this was because the doll-making activity was sedentary and meticulous, which may have led to a decline in the rate of change along the work process. In contrast, the games included different elements such as physical exercise and music, which invigorated the positive affect of the patients.

4) Comparing the HDS-R and NM scores before and after intervention

There were no differences in the HDS-R and NM scores before and after the intervention. Although the subjective QOL showed some improvement after each intervention, they probably did not effectively improve cognitive function and behavior. We think that the sessions were not sufficient and frequent enough, as they were conducted only once a week, over weeks. However, considering the intervention period of 3 months from the beginning to the completion of the doll-making activity, it may have added value in the cognitive function and behavioral evaluation during the intervention.

When he provided elderly people with dementia an opportunity to sing once a week, their BPSD reduced [21].

Regardless of the contents of the doll-making activity and the games, working together in groups

seems to have provided the participants a place for themselves and to share positive affect. These factors may have affected their cognitive function and behavior.

5) Limitations and future prospects

As mentioned above, by comparing the rates of change in the score on the modified ARS for a Daruma doll-making activity and games, we noted the characteristics of each activity. Joy and pleasure can be expressed through facial expressions and bodily movements during games. Therefore, they might have had a stronger influence on the positive affect. However, the doll-making activity requires concentration, will little possibility to express through facial expressions and bodily movements. Therefore, the ARS scores may have been low. Nevertheless, the subjective QOL was not completely low when the patients concentrated on their table work. To think of this, we should be more considerate in adding each of the positive affect on the modified ARS. Furthermore, we compared the activities only in terms of quantity. However, the quality issue, in terms of individuality of the elderly with dementia, needs to be addressed.

Considering these issues, we would like to continue research on subjective QOL.

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