Application of 18-item DEOS for dementia elderly people living at home and its reliability and validity

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Research background

The Ministry of Health, Labour, and Welfare (MHLW) of Japan has estimated that more than 3.45 million elderly Japanese individuals with dementia were certified as being eligible to receive Long-term Care (LTC) Insurance in 2015 and that 10% of Japanese subjects over the age of 65 years suffer from dementia.1 The number of elderly people with dementia has increased rapidly in Japan over the past 10 years. A report estimated that the total number of Japanese individuals with dementia was 1.49 million in 2002, but this number was expected to reach 4.7 million by 2025, representing 13% of the Japanese population over 65 years of age.2 Japan has experienced an unprecedented increase in the aging of its society, and the prevalence of elderly people with dementia also continues to increase year by year. With this in mind, the Japanese national government announced a "Five-Year Plan for the Promotion of Measures Against Dementia (Orange Plan)" in 2012. This plan was aimed at the realization of a society in which persons with dementia can live with dignity in a pleasant and familiar environment for as long as possible.3 Accordingly, the current direction of dementia care is to respect "personhood" and the patient's abilities.4

Through clinical experience, research, and the caring of a family member with dementia, one of the authors noticed that elderly subjects with dementia can maintain a good state and "personhood" despite a diagnosis of dementia. The utility of a scale, known as the Dementia Elderly Odayaka Scale (DEOS), for evaluating elderly people with dementia has been verified. The name of this scale contains the word odayaka, which in Japanese represents a good state as viewed by others. Kitwood (1992) defined the meaning of well-being as "to have self-esteem and to express self-emotion and to show self-expression and affection."5 In addition, the Japanese word odayaka encompasses not only mental stability, but also a good relationship with one's surroundings. Thus, it includes a good state for family caregivers as well as for people with dementia.

A literature review reveals several scales for assessing the state of dementia, including cognitive function tests and evaluations of dementia severity; the evaluation of mental function, behavior disorders and activities of daily life (ADL) has also been reported.6 From a behavioral psychology perspective, these scales often evaluate negative aspects of dementia. When assessing positive aspects, a quality of life (QOL) measure is often used in subjects with or without dementia. Brod (1999)7 developed the Dementia Quality of Life Instrument (DQOL) to measure the QOL of elderly people with dementia subjectively in an interview format. Suzuki (2005)8 has since developed a Japanese version of the DQOL and has verified its reliability and validity. However, the subjects of the present study were elderly people with mild dementia who could answer questions

correctly. As a measure of the QOL of elderly people with dementia, Terada (2002)9 developed a health-related QOL measure for Japanese subjects. This scale can be used to assess both negative and positive aspects of elderly people with dementia. In addition, Rabins and Kasper (1997)10-11 have developed the Alzheimer's disease health-related quality of life (AD-HRQL) scale. A Japanese version of this scale was created by Abe (1998) and Yamamoto-Mitani (2002).12-13 These comprehensive QOL scales can be used to evaluate the health of subjects with Alzheimer disease based on evaluations made by others, and they can also be used to evaluate positive aspects. In general, when measuring the QOL of elderly people with dementia, it is important to consider "what they can do,"14 rather than "what they can't do." Subjective evaluations made by such individuals should be respected. However, these subjects have memory and cognitive impairment symptoms as core features of their disease.15 Therefore, QOL evaluations performed by others, such as family members and caregivers, should also be completed.

Regarding the 25-item of the DEOS reported in a previous study,16 some facility staff members mentioned that "there are similar question items" and "I would like to reduce the number of questions" among their feedback. Furthermore, the inter-rater reliability of the scale needed to be verified. Consequently, an 18-item DEOS17 for elderly people with dementia living in healthcare facilities was developed. In addition, since the use of home care services is expected to increase in the future, the reliability and validity of the 18-item DEOS should also be verified for elderly people with dementia living at home. In the presently reported survey, both family members and nurses were included as evaluators, since the DEOS contains several items regarding the individual state of the subject. For example, some items concern the subject's daily life and personality, as well as their mental and social states. Thus, family members, who are in close contact with the subjects with dementia, are likely to provide useful evaluations of the subject's actual condition. In addition, family members are likely to be the primary caregivers at home. Therefore, in considering at-home dementia care, the actual situation, including the states of the family members, should be investigated.

Objectives

The aim of this study was to apply the 18-item DEOS to elderly people with dementia living at home and to examine its reliability and validity.

Operational definition of odayaka

In Japanese, the word odayaka generally means mental stability and quietness.18 In the present paper, odayaka was additionally regarded as meaning an ability to interact with

one's surroundings and to live in one's own manner despite a decline in cognitive function as a result of dementia.17

Research methods

1. Participants

1-1. Subjects

Ninety-three elderly people with dementia who were 65 years old or over and who lived at home and utilized home-visit nursing services within a single prefecture (Prefecture A) were enrolled. The subjects in this study were regarded as having been diagnosed with dementia based on the written opinions of the doctors in charge of their care. In consideration of the burden on the evaluators, we selected 15 facilities, each with a large number of nurses and users, from a list provided by the Home-Visit Nursing Facilities Association in Prefecture A and the Welfare and Medical Service Network System (WAM NET: http://www.wam.go.jp/).

1-2. Evaluators

The evaluators were nurses working for the 15 home-visit nursing services included in this study and the family members of the subjects (living together or living separately but close by). Each evaluator had to be aware of the subject's daily life. Family members were not evaluated on their cognitive function in consideration of their mental burden, etc. The nurses were asked to determine whether any communication problems were present when conducting discussions with the family members.

2. Evaluation methods

The intra-rater and inter-rater reliability were examined. Three evaluators (two nurses and one family member) evaluated each subject twice at an interval of about two weeks. When determining the test-retest reliability, a very short time interval can create a carryover effect, whereas a longer interval increases the chance that a change in status could occur. Most investigators have chosen an interval ranging from 2 days to 2 weeks.19 An interval of about 2 weeks was appropriate in this study because transient changes in emotions and attitudes were not evaluated.

3. Recruitment method and informed consent for subjects and evaluators

After obtaining written consent from the facility chief, the administrators of the home-visit nursing services selected subjects based on the cognitive function of the family members and the burden of this research, etc. Next, the administrator selected 2 nurses (excluding newcomers) who often visited each subject at home. The administrator

verbally explained the study to each nurse using the research document. The nurses consented to participate in the research by completing the research form. For family consent, the nurse verbally explained the study to each family member using the research document and obtained each family member's signature. For the subjects, the nurse or a family member explained the study in a manner suited to the subject's cognitive function.

4. Research forms

4-1. Eighteen-item DEOS (Document 1-2)

The 18-item DEOS is completed by an observer and is used to evaluate the daily life of a subject. The scale was revised to include 18 items, from among an original 25 items, based on the results of a previous study.5 The questions consisted of items regarding [Interactions with surroundings], [Personhood], and [Expression of emotions]. The maximum score for the 18 items was 72 points, with each item being evaluated using a 4-point Likert scale as follows: "Applicable," 4 points; "Somewhat applicable," 3 points; "Not very applicable," 2 points; and "Not applicable," 1 point.

4-2. Basic characteristic

The following characteristics of the subjects and evaluators were examined.

Subjects (elderly people with dementia): sex, age, diagnosis, level of long-term care (LTC), independence level in daily life, and clinical dementia rating (CDR). The CDR, which was first reported by Hughes et al.,20 is used to characterize six domains of cognitive and functional performance and related dementias (memory, orientation, judgment and problem solving, community affairs, home and hobbies, and personal care).

Evaluators (nurses): sex, clinical experience with dementia care, experience caring for the subject.

Evaluators (family members): sex, relationship with the subject, experience caring for the subject.

5. Research period

The research period lasted from April 2013 to July 2014.

6. Analysis

For each subject, three evaluators completed the 18-item DEOS on two separate occasions. The first evaluation had a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy that was as high as 0.94 when applied in a factor analysis, reliability analysis,

inter-rater reliability, and analysis of basic characteristics. To determine the inter-rater reliability, the average score obtained by two nurses and the score obtained by one family member were analyzed. For the statistical analysis, the IBM statistical package SPSS 22.0 J was utilized according to the following procedure.

First, an exploratory factor analysis (EFA) was conducted to investigate latent factors among the observed variables. Based on the content of each item and the factor loadings and after confirming that the 18 items could be divided into 3 areas, in the reliability analysis, the internal consistency from the item-total correlation and the Cronbach α coefficient between the whole area and each area were examined. When examining the test-retest reliability for the same evaluator, the intraclass correlation coefficient (ICC) of the total score for the first and second times was calculated for each nurse and for each family member. To examine the inter-rater reliability, the ICC of the total scores obtained by the nurses and family members and the score differences between the nurses and family members and between two nurses was examined for each question item. In addition, the score distributions according to the subjects' characteristics (CDR, LTC level, and diagnosis) were also analyzed. The Mann-Whitney U test was used to compare differences between patients with Alzheimer disease (AD) and those with vascular dementia (VaD).

7. Ethical considerations

The facility administrators encrypted the names of the subjects and evaluators and managed them in a ledger, to which the researchers did not have access. The subjects and evaluators were given an oral and written explanation regarding their freedom to withdraw from the study at any time.

This study was approved by the research ethics committee on Epidemiological Studies of Gunma University Faculty of Medicine (No. 24-51).

Results

1. Characteristics of subjects and evaluators

1-1. Subjects (Table 1)

Ninety-three subjects (28 men [30.1%], 64 women [68.8%], 1 not indicated [1.1%]) with an average age of 85.1 ± 7.0 years were included in the study. Thirty-two subjects (34.4%) were diagnosed as having AD, 19 (20.4%) were diagnosed as having VaD, 5 (5.4%) were diagnosed as having dementia with Lewy bodies (DLB), and 1 (1.1%) was diagnosed as having frontotemporal dementia (FTD); a detailed diagnosis of dementia was unavailable for the remaining 36 subjects (38.7%). An LTC level of 1 and an LTC level

of 5 were the most frequent (25% each). The largest proportion of elderly subjects with dementia (23%) had a daily life independence level of IV. CDR of 2 and a CDR of 3 were the most frequent (30% each).

1-2. Evaluators

Seventy-nine nurses participated as evaluators, (77 women [97.5%], 2 men [2.5%]). In this survey, each nurse evaluated between one and eight subjects. Their clinical experience related to dementia care was 10.5 ± 7.9 years, and their experience nursing each subject ranged from 0.1 to 11.8 years.

Ninety-three family members participated as evaluators (38 men [40.9%], 49 women [52.7%], and 6 not indicated [6.4%]). Twenty-seven family members were spouses (12 husbands and 15 wives), 53 were children (21 sons, 24 daughters, 8 sons' wives), 2 were brothers, 2 were sisters, and 4 were other relations; the remaining 5 evaluators did not provide an answer. The period during which they had provided care for the subjects was 3.9 ± 3.5 years.

2. Factor analysis (Table 2)

In the following section, an item (subscale) of the 18-item DEOS is indicated by quotation marks and the factor name in the factor analysis is indicated by square brackets. In a factor analysis of the 18 items, the interpretation of each factor was made based on items with factor loadings of 0.3 or above. Although the factor loadings of two items (Q2 and Q16) were 0.28, these items were judged to be necessary elements constituting the subscale and were included.

Factor I was named [Personhood] based on high factor loadings for "Being able to insist on one's will and wishes," "Being able to work hard at what one likes," "Being able to groom oneself (makeup, hair style, clothing, belongings)," and "Being able to perform one's daily routine at one's own pace." Factor II was named [Interactions with surroundings] based on high factor loadings for "Being able to pay attention to others," "Being able to be kind to others," and "Being able to spend time with a friendly person," Factor III was named [Expression of emotions] based on high factor loadings for "Being able to express joy with a smile," and "Being able to express emotions (such as pleasure and suffering)." For items with high factor loadings across 2 factors, the items were examined based on their factor loadings and contents. As a result, "Being able to do something for others" was classified as factor I, and "Being able to interact with surrounding people" was classified as Factor II.

The correlation coefficients between the factors were 0.75 for Factor I and Factor II, 0.75 for Factor I and Factor III, and 0.74 for Factor II and Factor III.

3. Reliability (Table 3)

3-1. Cronbach α coefficient and item-total correlation

The overall Cronbach α coefficient for the 18-item DEOS was 0.95, while the α coefficients for each area were 0.90 for [Personhood], 0.91 for [Interactions with surroundings], and 0.86 for [Expression of emotions].

Regarding the item-total correlation for each area, [Personhood] was 0.64 to 0.77, [Interactions with surroundings] was 0.73 to 0.80, and [Expression of emotions] was 0.57 to 0.76.

3-2. Intra-rater reliability

The total average scores of the test-retests for the evaluations made by the nurses were 46.0 points for the first evaluation and 47.3 points for the second evaluation, and the ICC between the first and second evaluations was 0.93 (P < 0.01). For the family members, the ICC between the first and second evaluations was 0.97 (P < 0.01), with 50.4 points for the first evaluation and 48.9 points for the second evaluation.

3-3. Score differences between the evaluations made by the nurses and the family members (Table 4-1)

For all 18 items, the average score differences (absolute values) between the evaluations made by the nurses and the family members ranged from 0.5 to 0.8 (range, 0 to 3).

3-4. Score differences between the evaluations made by the two nurses (Table 4-2)

For all 18 items, the average score differences (absolute values) between the evaluations made by the 2 nurses ranged from 0.5 to 0.8 (range, 0 to 3).

3-5. Inter-rater reliability

The ICCs of the total scores between the evaluations made by the 2 nurses and those made by the family members were 0.75 (P < 0.01) for the first evaluation and 0.73 (P < 0.01) for the second evaluation. In addition, the ICCs for each question item between the evaluations made by the nurses and those made by the family members ranged from 0.47 to 0.67 (P < 0.01) (Table 5).

4. Validity (Content validity)

In a previous study,16 specialists who study dementia provided advice and examined whether the DEOS questions were suitable for measuring the characteristics of the "Odayaka scale," thereby confirming the content validity.

5. Characteristics of subjects and frequency distribution

5-1. CDR and frequency distribution (Fig. 1)

The average scores for each of the question items were 3.3 for the CDR 0.5 group, 3.0 for the CDR 1 group, 2.9 for the CDR 2 group, and 2.1 for the CDR 3 group. The average scores for all the questions were lowest for the CDR 3 group (severe level). Except for the CDR 3 group, the average scores for all the questions were similar among the CDR levels.

5-2. LTC and frequency distribution (Fig. 2)

The average scores for each of the question items were 3.1 for the LTC 1 group, 2.5 for the LTC 2 group, 3.0 for the LTC 3 group, 2.7 for the LTC 4 group, and 2.2 for the LTC 5 group. The average scores for all the questions were lowest for the LTC 5 group. Except for the LTC 5 group, the average scores for all the questions were similar among the other LTC categories. "Being able to express joy with a smile" had the highest average score (3.2) among all the items and also had the highest average score (2.9) among all the items when examined in the LTC 5 group.

5-3. Diagnosis and frequency distribution (Fig. 3)

When patients with AD and those with VaD were compared, the patients with VaD had high scores for "Being able to insist on one's will and wishes" and "Being able to feel relaxed," while those with AD had a high score for "Being able to do something for others."

Discussion

1. Reliability

1-1. Reliability analysis

The overall Cronbach α coefficient for the 18-item DEOS was 0.95, while the α coefficients for all three areas ranged from 0.86 to 0.91, representing a high level of reliability. The item-total correlation ranged from 0.57 to 0.80, which was suitable (not too high, not too low).

1-2. Intra-rater reliability

A test-retest of the evaluations made by the same evaluator confirmed a high reproducibility, and a significantly high correlation was observed between the evaluations made by the nurses and between those made by the family members.

1-3. Inter-rater reliability

The ICC between the evaluations made by the nurses and those made by the family members ranged from 0.4 to 0.8, representing a moderate result (not too high, not too low). Furthermore, the average score differences between the nurses' evaluations and between the evaluations made by the nurses and those made by family members were very small. Consequently, the reliability of the 18-item DEOS was confirmed.

2. Validity

Three factors were extracted in the factor analysis. After considering the factor loadings for each item, factor I was named [Personhood], factor II was named [Interactions with surroundings], and factor III was named [Expression of emotions]. These results show a consistency with the definition of odayaka, which means "mental stability, the ability to interact with one's surroundings, and personhood." The items "Being able to interact with surrounding people" and "Being able to do something for others" had relatively high factor loadings. This result is due to the fact that the three regions are not independent of each other and are instead related and have some common features. After considering the content validity, "Being able to interact with surrounding people" was included in [Interactions with surroundings], while "Being able to do something for others" was included in [Personhood].

Regarding the criterion-related validity of the 18-item DEOS, other existing scales should be used in parallel. In the present survey, however, each evaluator had to perform the same survey twice within two weeks, and further investigations were not requested because of the burden to older caregivers (family members) and busy visiting nurses. However, a subscale of the 25-item DEOS (Tsujimura, Koizumi, 2010) in a previous study16 exhibited a significant positive correlation with a QOL scale12 and a significant negative correlation with the Behavior and Mood Disturbance scale (BMD).21 Therefore, the criterion-related validity of the 25-item DEOS was confirmed. Since the 18-items of the 18-item DEOS were selected from the 25 items of the 25-item DEOS, which exhibited significant correlations with other scales, the criterion-related validity of the 25-item DEOS was likely inherited by the 18-item DEOS.

3. Characteristics of subjects and frequency distribution of DEOS

The frequency distributions of the DEOS results were examined to determine how they change according to the CDR level and the LTC level (Figs. 1, 2). In either case, the outlines of the figures created by the item frequency distributions of the DEOS were similar, irrespective of the CDR or LTC level. This means that changes in the CDR and LTC levels affect the scores for each item of the DEOS in similar manners. The DEOS had a similar scoring tendency for CDR levels ranging from mild to moderate, and the odayaka of this study was maintained even at a moderate level. The average DEOS scores for each LTC group were similar to those of the CDR groups. Though the score exceeded 3 points for the LTC 1 and the LTC 3 groups, it was 2.5 points or above for the LTC 2 and the LTC 4 groups and was less than 2 points for the LTC 5 group.

For the question items evaluating facial expressions and emotions, such as "Being able to express joy with a smile," the scores were high regardless of the CDR or LTC level. Facial expressions and emotions are considered to be fundamental aspects of human beings as emotional beings, and they are likely to persist throughout one's lifetime. In fact, research into expressions of laughter and smiles in elderly people with severe dementia has been reported.22-23

When the patients with AD were compared with those with VaD in this survey, the AD patients tended to have high scores for items belonging to [Interactions with surroundings], while the patients with VaD tended to have a high score for "Insisting on one's own will." Further studies examining more data are needed.

4. Consideration of construct validity by comparison with previous research

The same three factors determined in the present study were also extracted in a factor analysis performed in a previous study.17 Although the subscales of factor II, [Interactions with surroundings], were similar to those in the previous study, the subscales of factors I and III were somewhat different. The factor [Fulfilling lifestyle] in the previous study was thought to be rather abstract and to encompass a variety of contents. Factor I was named [Personhood], as in the previous study, but the contents of the subscales for Factor III were captured more accurately and named [Expression of emotions]. The factor structures obtained by the factor analysis in the present survey and in the previous study were similar and were consistent with the definition of odayaka. Thus, the construct validity of the scale was confirmed.

5. Comparison of nurse evaluations performed at facilities and during home visits

Nurse evaluations performed at facilities and reported in the previous study17 were compared with those performed during home visits in the present study. The score differences were less than 1 for all the question items. In addition, the correlation coefficients of the test-retest reliability for the two groups were 0.9 (P < 0.01) or over. Consequently, a high reliability for the two comparisons was confirmed.

6. How to use the 18-item DEOS during home care

The effects of nursing interventions can be evaluated, since high DEOS scores can be expected for patients with a mild to moderate CDR. Also, if subjects have a severe CDR, then the overall DEOS score tends to be relatively low. In this situation, however, full advantage can be taken of the items with high DEOS scores.

In this survey, not only nurses, but also family members participated as evaluators.

At home, the main caregiver is often a family member, and nurses need to provide care within a relatively short time. Therefore, the DEOS can be used as an information-sharing tool between the family and nurses. Furthermore, sharing information among nurses can clarify the direction of nursing care and lead to care that takes advantage of the patient's positive aspects. Although caregiver burden is a problem in dementia care,24 use of the DEOS could help caregivers to pay attention to positive aspects and to alleviate the burden of nursing care. The DEOS can also be used for persons with mild cognitive impairment (MCI) who live at home.

The DEOS can be used to assess psychosocial aspects of elderly patients with dementia, such as personhood and their relationships with their surroundings. The DEOS can also be used to plan care that takes advantage of the patient's positive qualities also as a scale to evaluate the effects of nursing interventions.

Limits of research and future issues

In this survey, an evaluation of criterion-related validity was not performed in consideration of the burden to the family members and nurses who participated as evaluators. A detailed diagnosis of dementia had not been performed in many cases, and it was difficult to evaluate the influence of the dementia diagnosis on the DEOS score. In the future, the DEOS is expected to be widely used in actual clinical practice, such as in evaluations of the effects of assessments and care. Furthermore, differences in the use of the DEOS between Japan and other countries need to be examined.

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Abstract

Objectives: The aim of this study was to examine the reliability and validity of the 18 items of the Dementia Elderly Odayaka Scale (DEOS) in elderly people with dementia who lived at home. Methods: Ninety-three elderly people with dementia who lived at home and utilized a home-visit nursing service were enrolled. Three evaluators (two nurses and one family caregiver per subject) evaluated each subject twice at an interval of about two weeks. Results: A clinical dementia rating of 2 or 3 was the most common (30% of enrolled patients). With respect to the intra-rater and inter-rater reliability, the average difference between the two scores ranged between 0.5 and 0.8 for each item. The intraclass correlation coefficient using the test-retest method was 0.9 ($P < 0.01$), while that of the total scores evaluated by the nurses and family members was 0.7-0.8 ($P < 0.01$). The overall Cronbach α coefficient for the 18-item DEOS was 0.95, while the coefficients for each area ranged from 0.86-0.91. Based on a factor analysis, the 18 items

were classified into 3 domains: [Personhood], [Interactions with surroundings] and [Expression of emotions]. Conclusion: The reliability and validity of the 18 items of the DEOS were verified.

Table1　Characteristics of subjects		n=93
	n	%
Sex		
male	28	30.1
female	64	68.8
not indicated	1	1.1
Average age（85.1±7.0）		
male	81.6±5.9	
female	86.5±7.0	
Diagnosis[*]		
AD	32	34.4
VaD	19	20.4
DLB	5	5.4
FTD	1	1.1
others	36	38.7
LTC（Long-term care）		
Requiring support 1	1	1.1
Requiring support 2	2	2.2
LTC level 1	24	25.8
LTC level 2	11	11.8
LTC level 3	12	12.9
LTC level 4	19	20.4
LTC level 5	23	24.7
not indicated	1	1.1
Independence level in daily life		
I	5	5.4
IIa	15	16.1
IIb	19	20.4
IIIa	18	19.4
IIIb	11	11.8
IV	21	22.6
M	4	4.3
CDR(Clinical Dementia Rating)		
0.5	9	9.7
1	22	23.7
2	30	32.3
3	32	34.4
＊AD: Alzheimer disease		
VaD: Vascular dementia		
DLB: Dementia with Lewy bodies		
FTD: Frontotemporal dementia		

Table2 Factor analysis of 18 items DEOS*			n=93
item	factor I	factor II	factor III
Q12 Being able to insist on his/her will and wish	.80	−.21	.15
Q18 Being able to work hard at what he/she like	.73	−.05	−.03
Q11 Being able to groom (makeup, hair style, clothing, belongings) [Personhood]	.73	.08	−.06
Q9 Being able to perform the daily routine at his/her own pace	.71	.07	−.05
Q8 Being able to enjoy an old tale	.70	.21	−.03
Q15 Being able to do something for others	.38	.42	−.06
Q13 Being able to have pride as a human being	.38	.21	.31
Q16 Being able to be positive not negative	.28	.25	.26
Q4 Being able to pay attention to others	−.03	1.04	−.14
Q6 Being able to be kind to others [Interaction with the surroundings]	−.17	.78	.29
Q3 Being able to spend time with a friendly person	.24	.50	.07
Q1 Being able to interact with the surrounding people	.53	.32	.06
Q2 Being able to listen calmly to others	.27	.28	.30
Q14 Being able to express joy with a smile	−.21	.05	1.00
Q10 Being able to express emotions (such as pleasure and suffering) [Expression of emotions]	.32	−.14	.65
Q5 Being able to love small children and animals	−.03	.33	.46
Q17 Being able to feel relaxed	.25	−.07	.50
Q7 Being able to enjoy humor	.33	.19	.40
Eigenvalue	9.76	0.67	0.63
Contribution rate	54.20	3.74	3.47
Cumulative contribution rate	54.20	57.93	61.40
Correlation coefficients between factors I			
II	.75		
III	.75	.74	
Maximum likelihood method, promax rotation			
*DEOS: Dementia Elderly Odayaka Scale			

Table3 Reliability analysis among each area（18-items）				Corrected Item-Total Correlation	Alpha if Item Deleted
alpha= .95	alpha	M	±SD	Corrected Item-Total Correlation	Alpha if Item Deleted
Personhood（8 items）	.90				
Q8 Being able to enjoy an old tale		2.98	1.05	.77	.88
Q9 Being able to perform the daily routine at his/her own pace		2.89	1.00	.66	.89
Q11 Being able to groom（makeup, hair style, clothing, belongings）		2.13	1.01	.72	.89
Q12 Being able to insist on his/her will and wish		2.90	1.03	.65	.89
Q13 Being able to have pride as a human being		2.86	1.02	.76	.88
Q15 Being able to do something for others		1.91	0.92	.65	.89
Q16 Being able to be positive not negative		2.50	0.94	.64	.89
Q18 Being able to work hard at what he/she like		2.02	0.97	.66	.89
Interaction with the surroundings（5 items）	.91				
Q1 Being able to interact with the surrounding people		2.82	1.01	.76	.89
Q2 Being able to listen calmly to others		2.98	0.93	.73	.89
Q3 Being able to spend time with a friendly person		2.81	1.07	.73	.89
Q4 Being able to pay attention to others		2.69	1.03	.80	.88
Q6 Being able to be kind to others		2.93	0.98	.80	.88
Expression of emotions（5 items）	.86				
Q5 Being able to love small children and animals		2.73	1.05	.64	.85
Q7 Being able to enjoy humor		2.69	0.99	.73	.82
Q10 Being able to express emotions（such as pleasure and suffering）		2.96	0.93	.72	.82
Q14 Being able to express joy with a smile		3.30	0.85	.76	.82
Q17 Being able to feel relaxed		3.03	0.89	.57	.86

Table4-1

Scoring difference between 2 evaluators (family members and nurses)

18 items DEOS	−3	−2.5	−2	−1.5	−1	−0.5	0	0.5	1	1.5	2	2.5	3	total of absolute value	Average of absolute value
															n=93
Q1	0	0	1	3	14	16	28	11	14	3	3	0	0	58.5	0.6
Q2	0	0	1	3	10	9	32	18	16	1	2	0	0	51.5	0.6
Q3	0	1	2	3	12	12	26	10	13	7	4	1	0	68	0.7
Q4	0	0	5	4	14	9	25	16	12	6	0	1	0	66	0.7
Q5	0	0	3	2	11	2	29	12	15	6	8	3	0	74.5	0.8
Q6	0	1	3	3	9	8	34	10	17	4	2	0	1	61	0.7
Q7	0	0	4	4	9	14	30	11	8	8	4	0	0	63.5	0.7
Q8	0	1	1	3	13	7	36	12	11	6	2	0	0	55.5	0.6
Q9	1	1	0	4	12	11	28	12	10	6	7	1	0	70.5	0.8
Q10	0	1	0	5	8	10	28	16	19	3	1	1	0	59	0.6
Q11	0	0	1	1	8	13	37	11	11	6	4	1	0	54	0.6
Q12	0	0	3	3	12	14	32	13	11	3	1	0	1	56.5	0.6
Q13	2	0	2	2	7	6	34	14	13	5	5	1	0	63	0.7
Q14	0	0	1	4	17	6	37	20	3	3	1	1	0	50	0.5
Q15	0	0	0	0	14	17	34	10	5	5	6	0	1	55	0.6
Q16	0	0	2	3	11	10	24	20	13	5	1	1	0	59.5	0.7
Q17	0	0	3	5	7	9	26	18	21	1	2	0	0	60.5	0.7
Q18	0	0	1	3	8	8	36	15	11	6	4	1	0	56.5	0.6

The nurse's scores were the average of two people

Table4-2
Absolute value of scoring difference between 2 evaluators (2 nurses)

						n＝93
18 items DEOS	0	1	2	3	total vallue	Average value
Q1	43	32	7	1	49	0.6
Q2	43	30	8	1	49	0.6
Q3	35	34	13	1	63	0.8
Q4	40	35	7	1	52	0.6
Q5	43	24	10	1	47	0.6
Q6	48	26	9	0	44	0.5
Q7	32	36	14	1	67	0.8
Q8	41	29	13	0	55	0.7
Q9	33	33	15	2	69	0.8
Q10	30	36	15	1	69	0.8
Q11	42	30	9	2	54	0.7
Q12	44	32	5	1	45	0.5
Q13	37	26	15	2	62	0.8
Q14	44	33	5	1	46	0.6
Q15	44	32	7	0	46	0.6
Q16	33	38	11	1	63	0.8
Q17	42	33	8	0	49	0.6
Q18	44	29	7	3	52	0.6

Table5
ICC between 2 evaluators

18 items DEOS	Nurse and family	n=93
Q1	.66	**
Q2	.67	**
Q3	.57	**
Q4	.59	**
Q5	.47	**
Q6	.54	**
Q7	.55	**
Q8	.67	**
Q9	.48	**
Q10	.58	**
Q11	.65	**
Q12	.66	**
Q13	.51	**
Q14	.59	**
Q15	.56	**
Q16	.57	**
Q17	.54	**
Q18	.61	**

The nurse's score is the average of two people

** $p < 0.01$
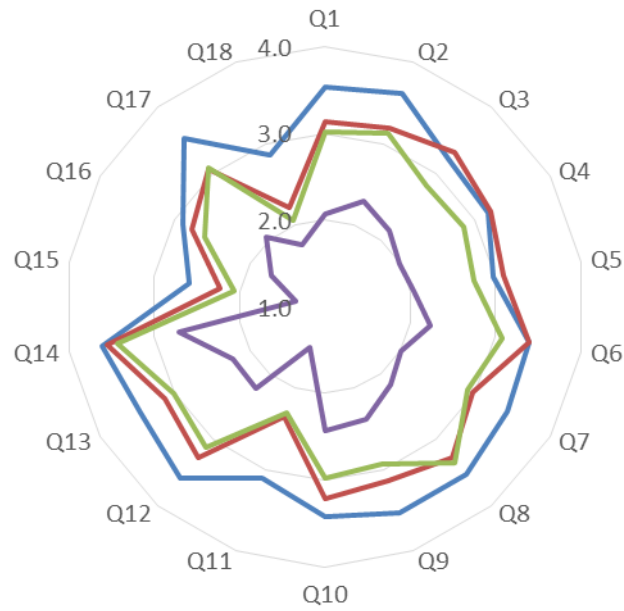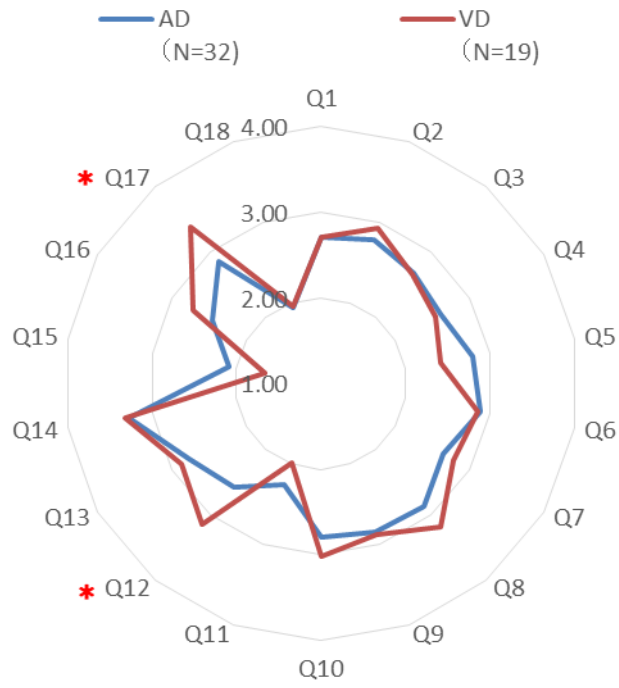
Figure1 Averege scores(CDR)
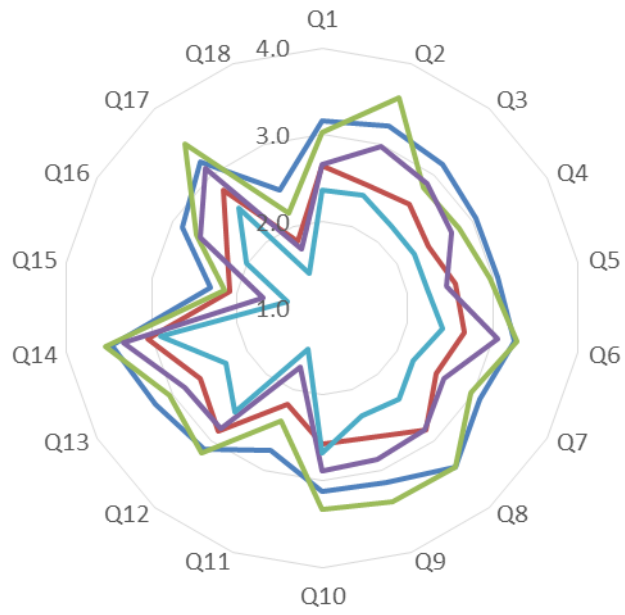
Figure2 Averege scores(LTC)

Figure3 Averege scores(Diagnosis)

(Document 1)

18items DEOS

Subject ID _____

Evaluator ID _____

Evaluation date(day/month/year)

Please check the appropriate level of the following items about the recent situation of subject.

		Applicable	Approximately applicable	Not very applicable	Not applicable
		4	3	2	1
1.	Being able to interact with the surrounding people				
2.	Being able to listen calmly to others				
3.	Being able to spend time with a friendly person				
4.	Being able to pay attention to others				
5.	Being able to love small children and animals				
6.	Being able to be kind to others				
7.	Being able to enjoy humor				
8.	Being able to enjoy an old tale				
9.	Being able to perform the daily routine at his/her own pace				
10.	Being able to express emotions (such as pleasure and suffering)				
11.	Being able to groom (makeup, hair style, clothing, belongings)				
12.	Being able to insist on his/her will and wish				
13.	Being able to have pride as a human being				
14.	Being able to express joy with a smile				
15.	Being able to do something for others				
16.	Being able to be positive not negative				
17.	Being able to feel relaxed				
18.	Being able to work hard at what he/she like				

Thank you for your cooperation.

(Document 2)

18項目版おだやかスケール
（18項目版DEOS）

〇回目調査

対象者様コード ＿＿＿＿＿＿

評価者様コード ＿＿＿＿＿

評価日（　　年　　月　　日）

対象者様の最近のことを思い浮かべながら下記の項目の該当するところに〇印をご記入ください。

		当てはまる	やや当てはまる	あまり当てはまらない	当てはまらない
		4	3	2	1
1	周囲の人と交流がはかれる				
2	人の話を落ち着いて聞ける				
3	気のあう人と一緒に過ごせる				
4	人のことを気遣える				
5	小さな子供やペットを愛しめる				
6	他者に優しくできる				
7	ユーモアを楽しめる				
8	昔話を楽しめる				
9	自分のペースで日課を過ごせる				
10	感情（喜びと苦しみなど）を表現できる				
11	好きなおしゃれ（化粧，髪型，服装，持ち物）ができる				
12	自分の意思や願いを主張できる				
13	人間としての誇りを持っている				
14	笑顔で喜びを示せる				
15	他人のために何かができる				
16	悲観的でなく前向きに過ごせる				
17	ゆっくりくつろげる				
18	好きなことに打ち込める				

ご協力ありがとうございました。