

Effect of wearing fingers rings on the behavioral and psychological symptoms of dementia: An exploratory study

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Teruo Yokoi¹, Hitoshi Okamura², Tomoka Yamamoto³,
Katsuya Watanabe⁴, Shigeko Yokoi⁵, Hitoshi Atae¹, Masayuki Ueda¹,
Takahiro Kuwayama¹, Shigekazu Sakamoto¹, Saaya Tomino¹,
Hideo Fujii¹, Takefumi Honda¹, Takayosi Morita¹,
Takafumi Yukawa¹, and Nobuko Harada¹

Abstract

Objective: This study was conducted to examine the effects of an approach that wears finger rings on elderly females with behavioral and psychological symptoms of dementia.

Method: The subjects were seven Japanese dementia patients living in elderly nursing homes. A single-case experimental design was adopted for the study. Each study subject was asked to put rings on her finger (from 9:00 to 19:00) for 7 days. The Neuropsychiatric Inventory, scenes of behavioral and psychological symptoms of dementia, interest in wearing rings, self-awareness, and overall profile were determined to assess the effect on the patients of wearing rings.

Results: The majority of nursing care providers stated, based on their assessment, that the “irritability/lability” that was noted during the baseline period disappeared during the ring-wearing intervention period in the three patients who displayed an interest in rings. In the assessment of the self-awareness ability, these three women were aware themselves of their intellect collapsing and were capable of conjecturing their own and others’ minds. It was commonly seen that the nursing staff, even though they had not been asked to do so by the researchers, told the patients, “Mrs. XX, you look so beautiful” when they found a patient wearing rings.

Discussion/conclusion: Individuals with low self-esteem are inclined to get angry and display aggression. In subjects with low self-esteem, anger and aggression readily arise when they are slighted by others. Self-esteem is low in those women who are aware of their own status of collapsing intellect. It is concluded that the words of conjuration, “you look so beautiful,” which the wearing of the ring per se by the patient elicited from the caregivers heightened the self-esteem and alleviated “irritability/lability” in the study subjects.

Keywords

Behavioral and psychological symptoms of dementia, ring, Alzheimer, dementia, self-esteem

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Introduction

Behavioral and psychological symptoms of dementia (BPSD) reduce the quality of life (QOL) of dementia patients and their care providers.¹ They also increase a sense of burden on the care providers,² as well as the necessity for patients to be institutionalized.^{3,4}

BPSD are caused by genetic, neurobiological, psychological, and social aspects.⁵

The first choice for BPSD is non-pharmacological intervention. The targets of non-pharmacological intervention are psychological and social aspects for BPSD. Various forms of

¹Department of Physical Therapy, Faculty of Health Science, Osaka Yukioka College of Health Science, Osaka, Japan

²Graduate school of Health Science, Hiroshima University, Hiroshima, Japan

³Heart Care Inc., Osaka, Japan

⁴Watanabe Clinic, Nisshoukai Medical Corporation, Suita, Japan

⁵Graduate School of Integrated Arts and Sciences, Hiroshima University, Higashihiroshima, Japan

Corresponding author:

Teruo Yokoi, Department of Physical Therapy, Faculty of Health Science, Osaka Yukioka College of Health Science, Osaka 567-0801, Japan.
Email: joy_yokoi@yahoo.co.jp



non-pharmacological intervention, including reminiscence, music, and aroma therapies, have been implemented. However, the results of a recent comprehensive review suggest that the reliability of their effects has not been established or that the effects do not continue.^{6–11} This result is obvious. If those therapies are conducted once a week on Alzheimer's patients, their long-term effects are not expected, particularly when the predominant symptom is memory impairment. Even if the therapies are implemented every day for 40 min, the interval between the therapies is 23 h and 20 min. Furthermore, it is very difficult for experts and staff members to conduct those non-pharmacological therapies every day.

Dementia does not involve impairment of a single category of cognitive ability, such as impaired memory, judgment, or orientation, and may include apraxia and agnosia.¹² Dementia is the general disturbance of these abilities,¹² and its essence is a decrease in self-awareness.^{13–16}

Since humans have the ability to be self-aware, unlike other primates, they can be conscious of themselves as well as other people and the surrounding environment. Consciousness is and must be oriented toward something (intentionality).¹⁷ Therefore, dementia patients who are conscious of themselves live in fear of and with anxiety over losing themselves. Bryden,¹⁸ an Alzheimer's patient, wrote a book to express her feelings about the awareness of herself collapsing. She identified a spot (mole) on her leg one day and stated that "Maybe it's cancer, and if I do not get it treated, I could die as 'me', ...". She was afraid of losing her self-awareness more than her actual death.

Therefore, non-pharmacological intervention for dementia patients with awareness of themselves collapsing needs to fulfill the following three requirements: (1) change the direction of patients' consciousness, which is oriented toward fear and anxiety, by stimulating and expanding their self-awareness, (2) apply stimulus on a continuous basis, and (3) needing only a small number of collaborators.

We focused our attention on finger rings. Rings were a symbol of the succession to the throne in ancient Egypt, earlier than 1000 BC. In medieval Europe (the 13th century), rings symbolized knights' love for noble ladies.¹⁹ Throughout human history, a significant number of legends about rings have emerged based on fierce battles for power and love, and the brilliance of rings has fascinated females.

When a woman wears a ring, it attracts attention of herself, such as while eating meals and talking with other people seated at a table. Even when she is not looking at her hand wearing the ring, she will probably notice it if she moves her hand on top of the other one. Thus, once a female has put a ring on her finger, it will continuously promote her femininity without the support of care providers and change the direction of her consciousness. Therefore, rings worn by females are considered to fulfill the above-mentioned requirements.

Thus, the objective of this study was to explore whether wearing a ring might afford reduction of BPSD in Japanese female patients with dementia.

Methods

Subjects

The study was conducted in seven female patients with dementia, primarily those having BPSD and judged to be aware themselves of their intellect collapsing. The patients were staying at five small-scale nursing homes for the aged located apart from each other. All of them had been diagnosed as having Alzheimer's disease according to the nursing home records. Medications were kept unchanged during the study period. The patient sample size to investigate the efficacy of the ring on the BPSD and explore the inter-individual differences in the efficacy was set at 7.

The length of stay at the nursing home prior to the start of this study was at least 10 months for all the seven patients so that change of the environment associated with accommodation into the home was unlikely to be the cause of the BPSD.

Study design

The study design was a single-case experimental study (A-B design). The subjects were first asked not to wear a ring during a baseline period of one week (A), and instructed to wear rings during a one-week intervention period (B). In addition, the study did not adopt A-B-A design. This was because the subjects with dementia might become confused, thinking that their rings had been stolen during a non-intervention period (A).

Interventions

The lead author and a coauthor as an observer visited the subjects 1 week before the initiation of the study (baseline period). The subjects were asked to choose 2 rings from among 12 different sample rings with variously colored stones displayed in a black jewelry case. Crystal glass from Swarovski Jewelry was used as the stones. The price of one set of crystal glass and a metal ring was approximately eight dollars. We asked the subjects to choose two rings because we wanted them to become strongly interested in rings. In the elderly nursing home, the lead author adjusted the circumferences of the rings using ring gauges and ring gauge sticks. The subjects were allowed to choose which fingers of the left hand they put the two rings on: the "fourth and fifth" or "third and fourth" fingers. We had received advice on the adjustment of the circumferences of rings from a clerk at a jewelry shop in advance.

The glass stones selected by the subjects were put on the adjusted metal rings, and we brought them to the elderly nursing home on the first day of the intervention period. The subjects put on the rings at 9:00 and removed them at 19:00. They were left in an office and taken care of by staff members at night. The researchers conducted one-on-one observation of the subjects, keeping an appropriate distance from

them, to prevent them from putting the rings into their mouth or pulling them off from their fingers forcibly.

Assessments

Overall profiles. The lead author asked the nursing care providers about the overall profiles of the subjects.

Interest in rings. The subjects' interest in rings was recorded by the coauthor in charge of observation.

Change in BPSD. Changes in the BPSD were evaluated on the basis of the Japanese version of the Neuropsychiatric Inventory (NPI),²⁰ a scale for assessment of the psychological symptoms of dementia patients, and information about the BPSD recorded by the care providers. Nursing care providers who had worked for at least 4 days during both the one-week baseline and the intervention periods conducted assessment using the NPI. This assessment was conducted after work on the last day of each period or the following day. In addition, pocket-sized notepads were distributed to all care providers so that they could record when BPSD appeared during the two-week period. Most of the care providers, who served as the evaluators, were female. The NPI evaluation method and BPSD recording method were explained in advance to each evaluator.

According to the NPI manual, a semi-structured interview is used for the assessment. In this study, the care providers were asked to conduct the NPI assessment after work on the last day of each period or the following day so as to avoid hazing of the evaluators' memory about their subjects. During the interview, knowledge is reconstructed from the interactions between the listener and speaker rather than by direct reporting of facts.²¹ Thus, what each speaker said could vary depending on the listener. It was impossible for the same author to interview many care providers working at five facilities located apart from each other and differing in the time at which the daily duty hours ended. For this reason, in order to avoid interview of the care providers by different interviewers (an approach which could reduce data reproducibility), we adopted the care provider self-entry in which no interviewer was involved in the NPI evaluation process.

Stage of self-awareness ability. This represents a method we have developed for assessing the stage of self-awareness of patients with dementia and consists of theory-of-mind tasks, self-evaluation tasks, and self-consciousness tasks.^{13–16} The theory-of-mind tasks inquire the ability of the patients to conjecture their own and others' minds, the self-evaluation tasks inquire the ability of the patients to understand their own present conditions, and the self-consciousness tasks inquire the ability of the patients to be sensitive of a psychological border between the patient's self and others. This staging was carried out by the lead author and the nursing care provider in charge.

Clinical Dementia Rating. The Clinical Dementia Rating (CDR)²² was used to assess the severity of general cognitive dysfunction. Assessment using the CDR was conducted by the nursing care provider in charge.

Criteria for judgment of the effects

The NPI consists of the following 10 categories: delusions, hallucinations, agitation/aggression, dysphoria, anxiety, euphoria, apathy, disinhibition, irritability/lability, and aberrant motor activity. The NPI score in each category was calculated by multiplying the frequency (0–4 points) by the severity (0–3 points). The higher the NPI score, the severer the level of a specific psychological symptom; an NPI score of 0 suggested that the absence of symptoms.

The care providers conducting the NPI assessment were confined to those who had worked for at least 4 days of the week during both the baseline period and the intervention period. At the nursing homes, the care providers worked in shifts, and each subject was evaluated by four or five care providers. Therefore, for the same subject, while some care providers encountered BPSD, others did not. To improve the validity of the evaluation under such circumstances, where different evaluations of the same subject might be made by multiple care providers, the efficacy judgment criteria adopted two requirements for making the judgment "effective": (1) no evaluator judged that the NPI score increased during the intervention period from the baseline and (2) a majority of evaluators judged that the NPI score decreased from the baseline to 0 during the intervention period. In addition, triangulation (combining the rating by evaluators with the scenes of BPSD recorded by all care providers) was adopted.

Ethical consideration

Informed consent was obtained from the subjects and their families. The study was conducted with the approval of the ethics committee of the university.

Results

Of the seven subjects, two discontinued wearing the ring during the intervention period, as they were afraid of being forced to buy the ring. Therefore, the results are presented based on data from the remaining five subjects.

The survey items included the age of the five subjects, their CDR, overall profiles, interest in rings during the intervention period, changes in the NPI scores and scenes of BPSD during the baseline and intervention periods, and stage of self-awareness ability. In the three patients who displayed interest in wearing rings (Cases 1, 2, and 4), scenes of BPSD related to the items of NPI that showed responses were described as recorded by the nursing care providers.

Table 1. Changes in the NPI scores for Case 1 between the baseline and intervention periods.

	Evaluators			
	A	B	C	D
Delusions		—		
Agitation/aggression	⊙ 1(1 × 1)–0	○ 2(1 × 2)–2(1 × 2) 3(3 × 1)–1(1 × 1)	⊙ 2(1 × 2)–0	⊙ 2(1 × 2)–0
Disinhibition	⊙ 1(1 × 1)–0			
Irritability/lability	⊙ 1(1 × 1)–0	○ 3(3 × 1)–1(1 × 1)	⊙ 1(1 × 1)–0	
Aberrant motor activity			⊙ 1(1 × 1)–0	

NPI: Neuropsychiatric Inventory.

Symbols indicate changes in NPI scores between baseline and intervention periods. ⊙ indicates decreased to 0.

○ indicates lower than that in baseline period. — indicates no change.

○(○ × ○)–○(○ × ○) indicates the NPI scores (frequency × severity) in the baseline and intervention periods. The higher the NPI score, the severer the psychological symptom.

Case 1: a female in her 70s, CDR: moderate

Overall profile. She walked by herself only between the living room and dining hall, which is a few meters away, in the nursing home. The distance was relatively short, and she was able to walk safely. She engaged in daily conversation; however, she had developed a loss of memory and had some difficulty communicating with other people. Although she never used violence toward other people, she easily became agitated and yelled frequently.

Interest in rings. Although she told us that “a ring would not suit me” at first, she started to enjoy wearing a ring since other residents said to her, “you look so beautiful.” When a staff member said to her, “Mrs. XX, the rings look beautiful on you,” she answered, “Yes, it looks nice on me because I am beautiful.” She often put up her hand and looked up at the ring.

She also talked to another subject (Case 2), sitting next to her to describe “how beautiful the ring was.”

Comments of care providers: she previously used to laugh with her mouth open, but after she began to wear the ring, she began to smile gracefully, placing her hand on her mouth. She has also started to lock the door of her room before she uses the bathroom (the act of a female covering her mouth with her hand implies shyness and modesty in Japan).

Changes in the NPI scores. Of the four evaluators who judged that there was “agitation/aggression” during the baseline period, three answered that no “agitation/aggression” was observed during the intervention period (see Table 1). Also, of the three evaluators who judged that there was “irritability/lability” during the baseline period, two answered that no “irritability/lability” was observed during the intervention period.

Scenes in which BPSD were identified. Although she easily became agitated and yelled four times during the baseline period, such behavior was not observed during the intervention period (see Table 2).

Stage of self-awareness ability. Passed the theory-of-mind tasks.

Case 2: a female in her 80s, CDR: moderate

Overall profile. She moved around the nursing home by herself using a wheelchair and walked around her room while holding bed rails and other railings. She engaged in daily conversation; however, she had developed a loss of memory and had some difficulty communicating with other people. Although she never used violence toward other people, she easily became agitated and yelled frequently. Furthermore, she frequently complained of migraine and occasionally muttered the words, “I’ll die soon.”

Interest in rings. She did not hesitate to wear a ring. Wearing the ring on her finger, she looked at it over and over again. Every time the staff members talked to her, saying, “Mrs. XX, you look so beautiful” she flashed a pleasant smile. When she was told, “Mrs. XX, this ring looks very becoming on you,” she behaved shyly. Every morning while putting a ring on her finger, she thanked a coauthor, and in the evening while removing it, she asked if she could keep it.

Changes in the NPI scores. All three evaluators who judged that there was “agitation/aggression” during the baseline period and both evaluators who judged that there was “dysphoria” and “irritability/lability” during the baseline period answered that they were not observed during the intervention period (see Table 3).

Table 2. Scenes in which the BPSD of Case 1 were identified.

 Period in which the rings were not worn

Day 4

Agitation/aggression and irritability/lability (in the daytime): After eating lunch, she was folding waste newspaper and suddenly started yelling, "I haven't had a meal," when she had finished folding it. After a while, she came to the office and yelled at staff members again: "I haven't had a meal." Later on that day, she yelled again: "I haven't had a meal."

Agitation/aggression and irritability/lability (in the evening): She yelled in the dining hall: "I hate that old woman."

Day 6

Agitation/aggression and irritability/lability (in the daytime): When she saw another resident removing name stickers off the tables in the dining hall, she yelled at that person: "Do not remove them."

Agitation/aggression and irritability/lability (in the daytime): She shouted, "I am tired," in the dining room.

 Period in which the rings were worn

 The records include no descriptions of agitation/aggression and irritability/lability.

 BPSD: behavioral and psychological symptoms of dementia.

Table 3. Changes in the NPI scores for Case 2 between the baseline and intervention periods.

	Evaluators			
	A	B	C	D
Delusions	⊙ 2(1 × 2) - 0			
Agitation/aggression	⊙ 2(1 × 2) - 0	⊙ 6(3 × 2) - 0	⊙ 6(3 × 2) - 0	
Dysphoria	⊙ 1(1 × 1) - 0	⊙ 4(2 × 2) - 0		
Anxiety		⊙ 6(3 × 2) - 0		
Disinhibition				⊙ 2(1 × 2) - 0
Irritability/lability	⊙ 1(1 × 1) - 0	⊙ 2(1 × 2) - 0		
Aberrant motor activity	— 4(4 × 1) - 4(4 × 1)	⊙ 6(3 × 2) - 0	— 4(4 × 1) - 4(4 × 1)	

NPI: Neuropsychiatric Inventory.

Symbols indicate changes in NPI scores between baseline and intervention periods. ⊙ indicates decreased to 0.

— indicates no change.

○(○ × ○) - ○(○ × ○) indicates the NPI scores (frequency × severity) in the baseline and intervention periods. The higher the NPI score, the severer the psychological symptom.

Scenes in which BPSD were identified. Although this subject easily became agitated and yelled eight times during the baseline period, such behavior was observed only once during the intervention period (see Table 4).

Stage of self-awareness ability. Passed the theory-of-mind tasks.

Case 3: a female in her 80s, CDR: moderate

Overall profile. She used a walker to move around the nursing home. She walked around her room while holding bed rails and other railings. She engaged in daily conversation; however, she had developed a loss of memory and had some difficulty communicating with other people. She went back and

forth between the second floor, on which the living room was located, and the first floor using an elevator, presumably due to anxiety. She came to the office frequently and asked the same question to the staff members. She sometimes became paranoid.

Interest in rings. On the first day of the intervention period, she said, "This does not suit me" and "Give it to someone more beautiful." She hardly looked at her ring from the second day onwards. She only had a glimpse of her ring at 7:00 in the evening while removing it. When she was told by a person sitting next to her in the day-service center located in the vicinity of the nursing home, "That ring is beautiful," she answered proudly, "Yes, it is beautiful."

Table 4. Scenes in which the BPSD of Case 2 were identified.

 Period in which the rings were not worn

Day 1

Agitation/aggression and irritability/lability (in the morning): She asked a staff member: "I want to visit Ms. XX near the sweet shop. Let me go out." The staff member said to her, "You cannot go out alone," and she yelled, "Are you telling me that I am not allowed to go anywhere by myself? It drives me crazy."

Agitation/aggression and irritability/lability (in the morning): She kicked the entrance door repeatedly while yelling, "Open the door. I can hardly breathe staying here all day."

Day 2

Agitation/aggression (in the daytime): She kicked a vending machine twice and put her fingers into the slot to look for coins.

Agitation/aggression and irritability/lability (in the evening): She yelled at a staff member: "You gave the sweet that I had bought earlier today to the man in a wheelchair, didn't you? The staff here always annoys me."

Agitation/aggression and irritability/lability (in the evening): She came to the office with her paper diapers in her hands and yelled at staff members: "Who took this out of the bag without my approval? I just can't believe it. Change it to a new one."

Day 4

Agitation/aggression and irritability/lability (at night): She yelled at a staff member: "Give the teeth (dentures) back to me. I do not want you to help me put them on."

Day 7

Agitation/aggression and irritability/lability (in the evening): She became angry and yelled saying that someone had taken paper diapers out of the bag in the living room without her approval.

Agitation/aggression and irritability/lability (in the evening): When a staff member talked to her in a wheelchair, "Excuse us. Let us pass through," to let another resident walk through, she yelled, "There is enough space."

 Period in which the rings were worn

Day 2

Agitation/aggression and irritability/lability (in the morning): When a staff member talked to her, saying, "Let's go shopping," she yelled at the staff member: "I do not want to go," "I have nothing to buy," and "I do not want to buy anything."

BPSD: behavioral and psychological symptoms of dementia.

Changes in the NPI scores. There was no obvious change in the NPI score (see Table 5).

Stage of self-awareness ability. Passed the theory-of-mind tasks.

Case 4: a female in her 90s, CDR: severe

Overall profile. She used a wheelchair to move around the nursing home. She walked to the bathroom in her room with the support of a staff member. Although she engaged in daily conversation, she only had fragmentary memories and almost always kept on talking without listening. She often talked to an imaginary person when she was in her room. Although she was usually in a state of euphoria and enjoyed singing nursery rhymes and popular songs, she sometimes became grumpy suddenly. She often talked to herself.

Interest in rings. On the first day of the intervention period, she said, "I do not want this ring because I have no money." However, she stopped saying that after she had received an explanation a few times and understood that she did not have to pay for it. When a nursing care provider spoke to her, saying, "Mrs. XX, you look so beautiful," she answered pleasantly, "Yes, it is beautiful." She often put up her hand and

looked up at the ring. She also talked to an imaginary person: "This ring is fancy" and "They gave me this ring."

Changes in the NPI scores. Of the five evaluators who judged that there was "irritability/lability" during the baseline period, three answered that it was not observed during the intervention period (see Table 6).

Scenes in which BPSD were identified. She experienced hallucinations and yelled four times during the baseline period. However, she yelled only once while removing the ring during the intervention period (see Table 7).

Stage of self-awareness ability. The patient passed the self-evaluation tasks with ease, but she did not even try to think about the inquiries in the theory-of-mind tasks, saying, "I just can't understand what these mean; I'm a punk!"

Case 5: a female in her 70s, CDR: severe

Overall profile. She had no difficulty walking. She often walked around the dining hall and talked to a mirror on a wall in the hall. She easily became angry when she called a staff member and the staff did not respond to her promptly. Although she engaged in some daily conversation, she

Table 5. Changes in the NPI score for Case 3 between the baseline and intervention periods.

	Evaluators				
	E	F	G	H	I
Delusions	⊙ 6(3 × 2)–0	⊙ 8(4 × 2)–0	— 6(3 × 2)–6(3 × 2)	Δ 1(1 × 1)–2(1 × 2)	— 12(4 × 3)–12(4 × 3)
Hallucinations	⊙ 2(1 × 2)–0				
Agitation/ aggression			— 1(1 × 1)–1(1 × 1)	× 0–6(3 × 2)	— 1(1 × 1)–1(1 × 1)
Dysphoria			— 1(1 × 1)–1(1 × 1)		— 1(1 × 1)–1(1 × 1)
Anxiety		— 6(3 × 2)–6(3 × 2)	— 3(3 × 1)–3(3 × 1)	— 3(3 × 1)–3(3 × 1)	— 2(2 × 1)–2(2 × 1)
Apathy	⊙ 1(1 × 1)–0				
Disinhibition		⊙ 2(1 × 2)–0	— 3(3 × 1)–3(3 × 1)	— 3(3 × 1)–3(3 × 1)	— 3(3 × 1)–3(3 × 1)
Irritability/lability	— 2(2 × 1)–2(2 × 1)		— 3(3 × 1)–3(3 × 1)	— 6(3 × 2)–6(3 × 2)	— 3(3 × 1)–3(3 × 1)
Aberrant motor activity	— 12(4 × 3)–12(4 × 3)	— 4(4 × 1)–4(4 × 1)	— 8(4 × 2)–8(4 × 2)		— 12(4 × 3)–12(4 × 3)

NPI: Neuropsychiatric Inventory.

Symbols indicate changes in NPI scores between baseline and intervention periods. ⊙ indicates decreased to 0. — indicates no change.

Δ indicates higher than that in baseline periods. × indicates increased from 0.

○(○ × ○)–○(○ × ○) indicates the NPI scores (frequency × severity) in the baseline and intervention periods. The higher the NPI score, the severer the psychological symptom.

Table 6. Changes in the NPI score for Case 4 between the baseline and intervention periods.

	Evaluators				
	J	K	L	M	N
Hallucinations	⊙ 3(3 × 1)–0	⊙ 3(3 × 1)–0	— 4(4 × 1)–4(4 × 1)	— 3(3 × 1)–3(3 × 1)	— 3(3 × 1)–3(3 × 1)
Agitation/aggression	⊙ 1(1 × 1)–0		○ 8(4 × 2)–6(3 × 2)	— 3(3 × 1)–3(3 × 1)	
Euphoria	⊙ 2(2 × 1)–0	○ 3(3 × 1)–1(1 × 1)		— 6(3 × 2)–6(3 × 2)	— 3(3 × 1)–3(3 × 1)
Apathy	— 6(3 × 2)–6(3 × 2)			— 1(1 × 1)–1(1 × 1)	
Disinhibition			× 0–3(3 × 1)	— 3(3 × 1)–3(3 × 1)	
Irritability/lability	⊙ 2(2 × 1)–0	⊙ 3(3 × 1)–0	⊙ 6(3 × 2)–0	— 3(3 × 1)–3(3 × 1)	— 3(3 × 1)–3(3 × 1)
Aberrant motor activity	× 0–2(2 × 1)	— 1(1 × 1)–1(1 × 1)			— 3(3 × 1)–3(3 × 1)

NPI: Neuropsychiatric Inventory.

Symbols indicate changes in NPI scores between baseline and intervention periods. ⊙ indicates decreased to 0. ○ indicates lower than that in baseline period. — indicates no change. × indicates increased from 0.

○(○ × ○)–○(○ × ○) indicates the NPI scores (frequency × severity) in the baseline and intervention periods. The higher the NPI score, the severer the psychological symptom.

almost always kept on talking and never listened. She told stories of her miserable life, which appeared to be fictitious, to the staff members with tears in her eyes.

Interest in rings. Even though she was told by her caregivers, “Mrs. XX, you look so beautiful,” she was scarcely concerned about the ring. She did not look at her ring while she

Table 7. Scenes in which the BPSD of Case 4 were identified.

 Period in which the rings were not worn

Day 1

Irritability/lability (in the daytime): She yelled, “Come out, Sesuo (name of a male)” and “What are you afraid of? How can you say that when you have never lived with me” while rattling the bedrail in the living room.

Day 4

Irritability/lability (in the morning): She yelled at the wall: “Who are you, stupid? Go away.”

Irritability/lability (in the evening): As a staff member walked in front of her room, the staff member heard her yelling: “That’s enough,” “What are you talking about? Are you a fool? Don’t be stupid.”

Day 7

Irritability/lability (in the evening): She yelled, “You are all stupid” and “Get arrested.”

 Period in which the rings were worn

Day 7

Irritability/lability (at midnight): As she did not take the rings off her fingers at 19:00, a staff member persuaded her to remove them when the staff member took her to the bathroom at midnight, and she held out her hand. The staff member removed the rings and put them in the case. When the staff member was leaving the room with the case, she yelled, “Do not take the rings,” “Put them there,” and “You are stealing my rings.”

BPSD: behavioral and psychological symptoms of dementia.

was putting it on or removing it. Even when she put the ring on or removed it by herself, she showed no expression. When she was having meals, she kept her ring hand on the table, but she hardly turned her eyes toward it. She said, “This ring is beautiful,” only once during the observation period.

Changes in the NPI scores. There were no changes in the NPI scores (see Table 8).

Stage of self-awareness ability. Not passed the theory-of-mind tasks, but passed the self-evaluation tasks.

Discussion

The effect of wearing a ring was evident in the three patients who displayed interest in wearing a ring (Cases 1, 2, and 4), whereas in the two patients who showed no interest in wearing a ring (Cases 3 and 5), no effect of wearing a ring was seen. As for specific NPI items, rings effectively alleviated “agitation/aggression” and “irritability/lability” in Case 1, “agitation/aggression,” “dysphoria,” and “irritability/lability” in Case 2, and “irritability/lability” in Case 4; rings reduced “irritability/lability” in all three patients.

Once a ring was worn on the finger, the “irritability/lability” vanished. Then, under what situation did the anger surge up? Aristotle²³ defined anger as a strong desire for revenge on someone who has explicitly slighted the person, which is accompanied by pain. In other words, anger is an emotion felt by a person in relation to ego (self-awareness) when his/her self-esteem has been reduced.²⁴ Cases 1 and 2 passed the theory-of-mind tasks in the evaluation of self-awareness. In Case 4, the patient passed the self-evaluation tasks with ease,

but she did not even try to think about inquiries in the theory-of-mind tasks, saying, “I just can’t understand what these mean; I’m a punk!” The theory-of-mind tasks inquire the ability of the patients to conjecture their own and others’ minds, while the self-evaluation tasks inquire the ability of the patients to understand their own present conditions. Case 4 did not try to tackle the theory-of-mind tasks, yet she caught on to her own mind (“I’m a punk!”). In other words, these three women were aware themselves of their intellect collapsing. Meanwhile, we who take care of these individuals with dementia are liable inadvertently to make light of them. We lie just to suit the occasion in case we are at a loss for answering an obstinate complaint by a subject with dementia. We are in such a situation just because we generally have in mind that patients with dementia can forget everything after all. It seems to be an undeniable fact that nursing care providers tend to slight subjects with dementia. Women with dementia who are still capable of conjecturing others’ minds, however, are sensitive to being slighted. The self-esteem of those women who are aware of their own collapsing intellect is hurt and diminishes when they are slighted by other persons. Individuals with low self-esteem are inclined to get angry and display aggression.²⁵ In women with low self-esteem, anger readily surges up when they are slighted by others.

This low self-esteem is considered to have been elevated upon wearing a ring. It seems that narcissism may be involved therein. At first, they said to us, “These rings do not suit me” and “You should give them to someone more beautiful.” Their remarks suggest that Japanese females of this generation believe that rings should be worn by beautiful people. The three females who responded to rings did not

Table 8. Changes in the NPI scores for Case 5 between the baseline and intervention periods.

	Evaluators			
	O	P	Q	R
Delusions	— 8(4 × 2) – 8(4 × 2)	— 4(4 × 1) – 4(4 × 1)	— 3(3 × 1) – 3(3 × 1)	Δ 3(3 × 1) – 4(4 × 1)
Hallucinations	— 8(4 × 2) – 8(4 × 2)	— 4(4 × 1) – 4(4 × 1)	— 4(4 × 1) – 4(4 × 1)	Δ 3(3 × 1) – 4(4 × 1)
Agitation/aggression	— 8(4 × 2) – 8(4 × 2)	⊙ 1(1 × 1) – 0	Δ 3(3 × 1) – 8(4 × 2)	
Dysphoria	— 8(4 × 2) – 8(4 × 2)	⊙ 1(1 × 1) – 0	— 1(1 × 1) – 1(1 × 1)	— 1(1 × 1) – 1(1 × 1)
Anxiety	— 4(4 × 1) – 4(4 × 1)		○ 3(3 × 1) – 1(1 × 1)	
Euphoria	○ 6(3 × 2) – 3(3 × 1)	— 4(4 × 1) – 4(4 × 1)	× 0 – 2(1 × 2)	Δ 1(1 × 1) – 4(4 × 1)
Apathy	○ 3(3 × 1) – 2(2 × 1)	— 3(3 × 1) – 3(3 × 1)	— 9(3 × 3) – 9(3 × 3)	— 3(3 × 1) – 3(3 × 1)
Disinhibition	○ 8(4 × 2) – 4(4 × 1)	— 1(1 × 1) – 1(1 × 1)	○ 3(3 × 1) – 2(2 × 1)	○ 6(3 × 2) – 1(1 × 1)
Irritability/lability	○ 8(4 × 2) – 4(4 × 1)	— 2(2 × 1) – 2(2 × 1)	— 6(3 × 2) – 6(3 × 2)	— 2(1 × 2) – 2(2 × 1)
Aberrant motor activity	— 8(4 × 2) – 8(4 × 2)	— 3(3 × 1) – 3(3 × 1)	○ 12(4 × 3) – 8(4 × 2)	— 9(3 × 3) – 9(3 × 3)

NPI: Neuropsychiatric Inventory.

Symbols indicate changes in NPI scores between baseline and intervention periods. ⊙ indicates decreased to 0.

○ indicates lower than that in baseline period. — indicates no change. Δ indicates higher than that in baseline periods.

× indicates increased from 0.

○(○ × ○) – ○(○ × ○) indicates the NPI scores (frequency × severity) in the baseline and intervention periods. The higher the NPI score, the severer the psychological symptom.

necessarily wear them happily at first. However, the remarks of the nursing care providers and other residents, such as, “Mrs. XX, you look so beautiful,” motivated them to wear them. As they continued to wear rings every day, the rings became increasingly integrated into their lives. Now that the rings, accessories only worn by beautiful people from their point of view, had become an integrated part of them, they became increasingly assured that they themselves were beautiful every time people said to them, “Mrs. XX, you look so beautiful,” and their self-esteem was improved based on their self-evaluation. It did not take long for them to be able to believe that they were beautiful. Narcissism is “the libidinal complement to the egoism of the instinct of self-preservation.”²⁶ That is to say, people cannot continue to live without self-love. For women, “beautiful” is a word of conjuration that improves their self-esteem. After putting rings on her hand, Case 1 laughed gracefully while covering her mouth. She also started to lock the door of her room before she used the bathroom. These behaviors are typical examples of the power of the word of conjuration “beautiful” to enhance the sense of femininity and self-esteem. Those with high self-esteem do not really care when other people do not pay much attention to them.²⁵ Since their self-esteem had been improved by other people’s remarks, such as, “Mrs. XX, you look so beautiful,” they were more tolerant of acts

of slight. As a result, “agitation/aggression” and “irritability/lability” are alleviated.

In Case 1 and Case 2, “agitation/aggression” and “irritability/lability” subsided when the patients wore rings. “Irritability/lability” and “agitation/aggression” originally represent similar concepts to each other. The scenes where these two combined concepts arise are conjectured to be often identical so that it would appear probable that “agitation/aggression” subsided in association with diminishing emergence of “irritability/lability.”

In Case 2, ring-wearing led to the subsidence of “dysphoria.” This patient frequently complained of migraine and occasionally muttered the words, “I’ll die soon.” Depressed mood is not uncommon among patients with Alzheimer’s disease and is characterized by dysthymia, while the sense of sorrow and feeling of guilt/self-accusation are rather inconspicuous in these patients, unlike *tō* in patients with depression. Such depressed mood in patients with Alzheimer’s disease readily improves in many instances in response to a favorable environment and optimized personal relations.²⁷ The heightened self-esteem of a woman who is told, “Mrs. XX, you look so beautiful,” by the staff members made her feel happy. As a result, the “dysphoria” subsides in such a case.

The use of rings has thus proved to have particular efficacy in these three cases, although this is a rather small

number of patients. Rings led the nursing care providers and other people to say, “beautiful” to the residents of the nursing home. The researchers did not ask the care providers to say, “beautiful” to the residents. Thus, wearing of rings, which has fascinated females in general, was found to attract the attention of the female care providers in this study, even when it was a low-priced one. The power of rings led them to say that, and existing non-pharmacological interventions do not have such power.

The results of this study suggest that an effective non-pharmacological intervention for patients with dementia is an approach that helps people involved in dementia care to improve the self-esteem of dementia patients, who tend to have their feelings hurt easily, albeit unintentionally. In other words, the target of non-pharmacological interventions is the surrounding people, not the dementia patients themselves.

During this study, the coauthor, who had been monitoring the study, observed and recorded the interest of the subjects in the rings. That is, the author also played the role of an evaluator, in part. This was aimed at allowing the care providers to focus on observation and recording of the scenes of the BPSD. It was considered that if the recording of the subjects’ interest in the rings was assigned to the care providers, the descriptions of the care providers would be confined to the interest of the subjects in the rings. In such an event, it would have been impossible to observe communication related to the ring between the subject and the care provider, and it would have been difficult to find, for example, that when the care provider said to her, “Mrs. XX, you look so beautiful,” the subject’s self-esteem would have been elevated and her “agitation/aggression” and “irritability/lability” reduced. We believe that the recording of subjects’ interest in the rings by the coauthor worked positively in approaching the main aspect of the ring’s efficacy, with its benefit outweighing the risk of biases.

Limitations and open issues of the study

The results of this study suggest that in subjects with dementia manifesting BPSD, wearing of rings can alleviate “agitation/aggression” and “irritability/lability.” These are included as items in the Cohen-Mansfield Agitation Inventory (CMAI)²⁸ focusing on agitation. CMAI allows quantitative evaluation of the frequencies of 29 agitation-related items based on responses provided on a 7-grade scale. Because each of these items is expressed with verbs corresponding to concrete behaviors, the interviewee can answer the questions easily, without being required to interpret the sentences written in the questionnaire. This study was designed as an exploratory study in seven subjects. It is necessary to verify the results in a larger number of subjects and to confirm the indications of the “ring” approach quantitatively using the CMAI.

An essential remedy for alleviating the BPSD in persons with dementia who are aware of their own collapsing intellect appears to be to elevate the self-esteem of these individuals. Self-esteem is not heightened unless it is taken good care of by other persons. Another open issue is to discover and develop other means, in addition to rings, by which care providers can show their appreciation to persons with dementia.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

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