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Original Article

Questionnaire study on the dietary environment for nutritional improvement of the elderly in unit care type special nursing homes in the Kinki district

Terumi AIBA[1)], Motoko MATSUI[2)], Keiko TOMITA[3)], Kimiko OHTANI[2)]
[1)] *Faculty of Health Science, Kyoto Koka Women's University* *
[2)] *Graduate School of Kyoto Prefectural University* **
[3)] *Faculty of Agriculture, Kinki University* ***

Summary

The effects of "cooking within the living unit" (CWLU) in "unit care type special nursing homes for the elderly" on resident's physical status and quality of life (QOL) have been clarified in previous reports. Although there is a good appreciation for CWLU, actual implementation is often seen to be difficult. The purpose of this study was to clarify the present condition of the dietary environment in the unit care type nursing home in comparison with that in the conventional type. We conducted a questionnaire study with dietitians at special nursing homes for the elderly in the Kinki district in 2009. It was suggested that the unit care type was more like a home because of greater freedom in the dietary environment, and a higher number of residents had the opportunity to converse among themselves and with the staff while eating. When considering the dietary environment for the improvement of nutritional status and QOL of residents in the unit care type special nursing homes for the elderly, it is important to develop nursing methods that make effective use of facilities such as CWLU. In addition, it is necessary to increase the number of staff in order to perform individual care more effectively and sufficiently.

Introduction

In Japan, the percentage of elderly people has been rising annually. The National Institute of Population and Social Security Research showed that the aging rate in Japan was 24.1% in 2012, but is predicted to reach 39.9% in 2060[1)]. Because the number of users of the long-term care insurance system has been increasing, the government is promoting the maintenance of facilities in special nursing homes for the elderly and the revision of the nursing system. Moreover, nutritional care management is now in progress in special nursing homes for the elderly following the revision of the long-term care insurance law in 2005. Under such reformation, registered dietitians are better able to assess a resident's physical status, nutritional state, and eating functional status. Furthermore, meals are provided to cater for nutritional care based on the Nutritional Improvement Manual[2)]. Meals in special nursing homes for the elderly now contain an appropriate amount of nutrients within the tolerance levels shown in Dietary Reference Intakes for Japanese , 2010. For nutrient provisions to be calculated by registered dietitians, the amount of vitamins and minerals, which are insufficient in the elderly diet, should be based on recommended dietary allowance (RDA). However, these amounts often fall into the category of malnutrition in special nursing homes for the elderly, even when a well-balanced diet is provided, since residents may not be in good health or do not consume all of their meal because it does not suit their preference. Sugiyama reported that protein energy malnutrition (PEM) had been observed among 40% of the elderly who needed nursing care[3)]. It is important for many residents not to have leftovers from meals and to be able to enjoy eating meals in those facilities. If the residents are satisfied with meals, they are able to keep and improve proper nutritional status. Furthermore, adequate nutrition should relate to better activities of daily living (ADL) and quality of life (QOL). A guideline for "unit care" was introduced by the Ministry of Health, Labour and Welfare in 2002, and a grant was provided to renovate existing facilities into "small living unit-type special nursing homes for the elderly" (also called "the new unit care of geriatric welfare homes for the elderly")[4)]. The definition of "unit care" by

* Adress : 38 Kadono-cho, Nishikyogoku, Ukyo-ku, Kyoto, 615-0882, Japan
** Adress : 1-5, Hangi-cho, Shimogamo, Sakyo-ku, Kyoto, 606-8522, Japan
*** Adress : 3327-204, Naka-machi, Nara, 631-8505, Japan

the Ministry is as follows: "Nursing care is to provide the users with a living environment similar to home so that each user can perform common daily life activities in accordance with their individual characters and life rhythms while building human relationships with others." Under this concept, the residents are divided into small groups, with each group living in a unit that has a home-like atmosphere. Each unit is designed to have private rooms for each resident and a common living area.

In recent years, the aim has become more focused on the improvement of residents' QOL, and the facilities are being transformed into the "unit care type." In our previous paper we defined "cooking within the living unit" (CWLU) as follows: the cooking staff cook the staple foods, main dish, and side dish in the kitchen in the unit every day, and the residents also can take part in cooking[5]. In the paper, it was clarified that in the special nursing home for the elderly that introduced CWLU, residents' eating behaviors showed improvement such as expressing their will about meals as the staff were able to provide a home-cooked meal and individual care quickly, and the nutrient and mental statuses of the residents were improved. The effects and challenges of unit care have been reported by other studies[6-8]. However, according to Miura *et al.*, among the facilities with a kitchen in the living unit, only 4.9% of these are actually used[9]. This suggests that although there is a good appreciation for the benefits of CWLU, actual implementation is often seen to be difficult. There are many facilities that prepare meals in a large kitchen and then warm these meals up in the kitchen of the unit, even if the facility has been reconstructed into the unit care type special nursing homes for the elderly using the government grant.

We reported the influence on QOL of residents in special nursing homes for the elderly where CWLU was introduced into unit care by focusing on residents' dietary behavior and physical condition[5]. Variation in diet and the dietary intake of the residents, based on case records kept by the registered dietitian, showed a change toward improvement, and BMI, serum albumin, and hemoglobin values either improved or were maintained among many residents. The cooking staff are able to determine residents' eating conditions directly in the facilities with CWLU, and communication among staff and residents is also possible. This enables the cooking staff to easily change the variation of the diet according to a resident's physical condition and chewing ability. Yamashita *et al.* reported that energy provision decreased by 70% in a chopped diet and 66% in a blender diet when compared with a regular diet[10]. According to Kosaka *et al.*, zinc intake was higher in the case of a regular diet group compared with a rice gruel group among elderly patients in a nursing facility[11]. Nagai *et al.* reported that the choice between normal and *kizami* (finely minced food) diets was influenced by the opinion of the nursing staff[12]. Minced and blender diets cause a reduction in appetite because of the visual image and texture. Having a standard diet as much as possible, when there are no major problems in the ability to chew and swallow, leads to better ADL and QOL for the elderly. For example, to maintain the texture of food, it is better not to mince soft food for ease of eating. It is thought that such observations on an individual basis by the cooking staff in CWLU facilities have led to the maintenance and improvement of the nutrition status of the residents.

In this study, a questionnaire study was conducted at special nursing homes for the elderly to examine and compare the dietary environments of the unit care type and conventional type special nursing homes for the elderly. Since there was no preceding study on this theme, we have chosen the Kinki district as the first case.

Methods

1. Constitution of the questionnaires

A questionnaire study was conducted by mail at the special nursing homes for the elderly in the Osaka, Kyoto, and Shiga prefectures during October and November 2009. The study concerning the dietary environment was conducted with dietitians and registered dietitians. The questionnaire covered the following topics: the number of residents, type of facilities (unit care type or conventional type), environment of facilities, daily life, dietary life, and resident's QOL.

2. Statistical analysis

Data analysis was performed using IBM SPSS Statistics version 21 software. For the questionnaire study, we used the Mann–Whitney U test to compare the dietary environment between unit care type and conventional type facilities. To compare the condition of dining settings, the χ^2 test was used.

Results and Discussion

1. Facilities

There were 531 special nursing homes for the elderly in Osaka, Kyoto and Shiga prefectures in total in 2009 (Osaka prefecture: 345, Kyoto prefecture: 119, and Shiga prefecture: 67) that were listed by those prefectural governments as a special nursing home for the elderly. Question-

naires were mailed to all those 531 facilities and answers were returned from 194 facilities (Osaka prefecture: 111, Kyoto prefecture: 54, and Shiga prefecture: 29). The response percentage was 36.5% . The respondents' occupational categories were mainly dietitians and registered dietitians. Some were answers from the director of the facility, the care staff, and the office workers as a joint answer. The average number of residents per facility was 70.7 people (average number in the stage of long-term care: 4.1). The attributes of the facilities are shown in Table 1. The ratio of answers from the unit care type facilities was 33.5%, and the conventional type was 66.5%. According to the Ministry of Health, Labour and Welfare in 2011, the ratio of unit care type facilities was 28.9% among all the aged care facilities. The distribution ratio of the types of the facilities in this study tended to be similar to the statistical results of Japan as a whole[13]. In Shiga prefecture, the percentage of the unit care type was higher than that of other prefectures. There were 54 facilities with a conventional type that answered that efforts were being made to provide a similar environment to that of unit care type. In more practical terms, the number of facilities answering that groups had been formed similar to the unit care and were nursing a smaller number of people were many (37 facilities). There were facilities that were making efforts in protecting privacy by setting up partitions and curtains in the shared rooms (11 facilities). There were also facilities that grouped staff as a work system, and fixed the number of staff members just like unit care (11 facilities).

Table 1 Attributes of facilities (n = 194)

Prefecture	Unit care type		Conventional type		Total	
	n	%	n	%	n	%
Osaka	37	33.3	74	66.7	111	100.0
Kyoto	13	24.1	41	75.9	54	100.0
Shiga	15	51.7	14	48.3	29	100.0
Total	65	33.5	129	66.5	194	100.0

2. Dietary environment

The comparison of dietary environments between the unit care type and the conventional type was made using Mann–Whitney U test. It is shown in Table 2. There were significant differences except for "Is the finishing time of the meal fixed?" and "Are food preferences and requirements reflected?" Concerning "Is the finishing time of the meal fixed?", about 40% of both the unit care type and the conventional type answered "Yes". Concerning "Are food preferences and requirements reflected?", 80% of both the unit care type and the conventional type answered "Yes". There were significant differences regarding the other questions. The menu was posted in all conventional type homes, whereas 7.8% of unit care type homes answered "Neither". Moreover, the percentage of the answers "No" and "Neither" about "Is the dining area fixed?" and "Is the starting time of the meal fixed?" were higher in the unit care type facilities compared with the conventional type. Although the overall number of residents and staff talking while eating was low in both types of nursing homes, the percentage of the residents talking while eating was higher in the unit care type than that of the conventional type.

Table 2 The comparison of dietary environments between a unit care and a conventional type facility

Question	Answer	Unit care type		Conventional type		p-value *
		n	%	n	%	
Is the menu posted? (n = 193)	Yes	59	92.2	129	100.0	
	Neither	5	7.8	0	0	< 0.05
	No	0	0.0	0	0	
Is the dining area fixed? (n = 188)	Yes	51	83.6	120	94.5	
	Neither	8	13.1	4	3.1	< 0.05
	No	2	3.3	3	2.4	
Is the starting time of the meal fixed? (n = 183)	Yes	46	80.7	121	96.0	
	Neither	9	15.8	4	3.2	< 0.05
	No	2	3.5	1	0.8	
Is the finishing time of the meal fixed? (n = 181)	Yes	20	35.7	47	37.6	
	Neither	19	33.9	47	37.6	n.s.
	No	17	30.4	31	24.8	
How many people talk while eating? (n = 191)	Almost all	2	3.1	0	0	
	More than half	3	4.7	8	6.3	
	Half	18	28.1	17	13.4	< 0.05
	Less than half	33	51.6	81	63.8	
	None	8	12.5	21	16.5	
Are food preferences and requirements reflected? (n = 192)	Yes	51	78.5	100	78.7	
	Neither	11	16.9	22	17.3	n.s.
	No	3	4.6	5	3.9	

* Mann–Whitney Utest

In addition, it was found that the residents were not only talking with each other but also with staff as well. These results suggest that in the unit care type facilities the place and time of the meal are fairly flexible, and a higher number of residents talked while eating because the small groups made it easier to understand each other.

The comparison of the condition of dining settings between the unit care type and conventional type facilities is shown in Fig. 1. We asked the utilization of individual cups, chopsticks and rice bowl, and the utilization of trays, place mats, table cloths and flowers on the table. The answer was either "Yes" or "No", and the percentage of utilization (answer of "Yes") was shown. As a result of the χ^2 test, the condition of the dining settings was significantly different except for "Use of table cloths." Table cloths were rarely used in both types of facilities. Trays are generally used to set the meal individually in nursing facilities and hospitals. For the unit care type facility, the percentage of those using trays was lower in comparison with the conventional type, and the percentage of those using place mats was higher in comparison with the conventional type. Moreover, the percentage of responses to the statements "Use of an individual rice bowl, chopsticks, and cups" and "There are flowers on the table" was more than half in the case of unit care type facilities. Regarding meal habits at home in Japan, there are so-called *zokujinki* (tableware for personal use), and the Japanese often use their own individual tableware. Imai reported that the highest level of personal use, in the 80–90% range, was for chopsticks, followed by rice bowls and teacups, and most resistance to the common use of tableware was expressed for chopsticks[14]. In the conventional type facility, communal tableware is often used. Therefore it could be suggested that the unit care type facilities are more like a home with regard to the condition of dining settings.

3. CWLU

Table 3 presents the answers about the kitchen where the residents can participate in the cooking. The percentage of kitchens available for resident participation was 76.9% in the unit type facility, which was higher than that of the conventional type. However, 36.4% of those were not used despite having a kitchen in the unit. In those cases, it seems that the cooking is done entirely in a large-scale cooking facility (then the meals are brought to each unit), which is the same as the conventional type. Therefore, it could be difficult for the cooking staff in the unit to adjust seasoning according to a resident's preference or to mince food according to the resident's chewing capability. In the facilities where the residents take part in cooking, tasks such as "Cutting food with a kitchen knife", "Washing rice", "Mixing ingredients", and "Serving" were carried out. There were a lot of additional comments provided that the residents took part in the cooking for lunch and

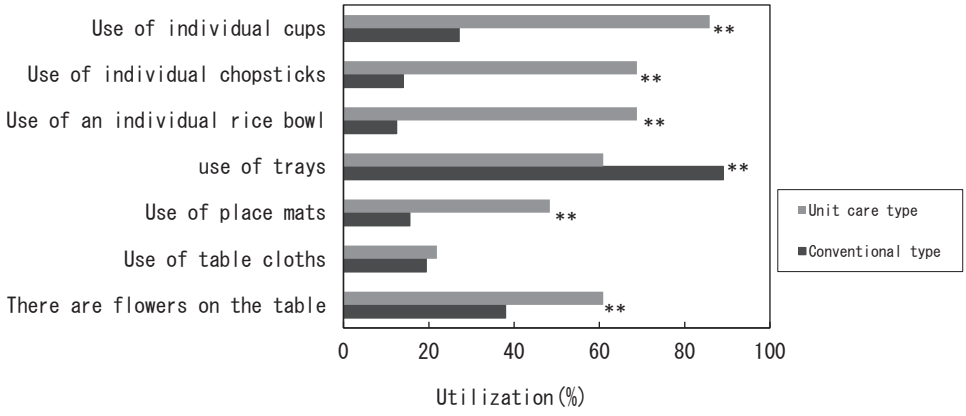

Fig. 1 The comparison of utilization of dining settings between unit care type and conventional type facilities.
χ^2 test, $^{*}p < 0.05$, $^{**}p < 0.01$

Table 3 The comparison of kitchens available for residents between unit care and conventional type facilities

Question	Answer	Unit care type		Conventional type	
		n	%	n	%
Is there a kitchen available for use by residents?	Yes	50	76.9	29	22.7
	No	13	20.0	91	71.1
	Other	2	3.1	8	6.2
	Total	65	100.0	128	100.0
Do the residents use the kitchen?	Yes	26	59.1	14	63.6
	No	16	36.4	7	31.8
	Other	2	4.5	1	4.6
	Total	44	100.0	22	100.0

making sweets at the dining table as an event, even when there was no kitchen that the residents were able to use. There were answers about the advantage of residents taking part in cooking, such as "An old ability revived", "Improvement in resident's appetite", "Increased conversation among the residents and the cooking staff", and "Had a good time." However, some problems were mentioned about residents taking part in cooking, including "There was a risk of accident and injury", "Issues on hygiene aspects such as resident's hands being dirty", "The requirement for staff to be present", and "There were some residents who were able to cook but there were others who were unable to do so."

4. Factors for residents' improved QOL

There are various factors that influence the achievement of a better QOL for the elderly in special nursing homes, such as human relations among residents and staff, facility equipment, nursing care and medical services, daily activities, and meal services. Carrier *et al.* showed the importance of the relationship between meal services and a better QOL[15]. Kitabayashi *et al.* reported that a significant correlation was found between "satisfaction with food and food services" and "meal requests are met" as far as institutionalized elderly people are concerned[16].

Table 4 shows the result of responses to the statement "Please choose up to five factors from the 20 factors listed, which you think have a relationship with resident's improved QOL and satisfaction." Twenty factors were classified into four categories: Individual condition of residents; Care method of the facility; Concern about meals; and Environment of the facility. "Individual condition of residents" had the highest percentage among all four categories (35.7%), followed by "Care method of the facility" (34.6%).

After the examination of each factor by the χ^2 test, only "The facility is a unit care type" was significantly different between the unit care type and the conventional type of facility ($p < 0.001$). There was no significant difference with other options. Concerning "The facility is a unit care type", 11 (16.9%) among 65 facilities of the unit care type chose this option, while only 3 (2.3%) among 129 facilities of the conventional type chose this option. It was suggested that "factors related to residents' improved QOL and satisfaction" did not relate to the types of facilities because only a few chose "The facility is unit care type", even if the facility was a unit care type. It was thought that residents' improved QOL and nutritional improvement would not be expected, even in a unit care type, if it provided the same meal service as that of a conventional type. The important point is not the type of facility, but the care method employed at unit care type facilities.

The factor that attracted the highest number among all factors chosen by respondents was "Meals are delicious (n = 125)", followed by "Good relationships between care staff and residents (n = 120)", "Resident's good physical health condition (n = 100)", "Resident's good mental health condition (n = 97)", and "Good relationship with family (n = 85)." "Resident's good physical health condition" and

Table 4 Factors related to residents' improved quality of life and satisfaction

Item	Factors	Unit care type n = 65	conventional type n = 129	Total	
		n	n	n	%
Individual condition of residents	Resident's good physical health condition	35	65	100	
	Resident's good mental health condition	37	60	97	
	Good relationship with family	31	54	85	35.7
	Good relationship among residents	11	27	38	
	Good financial condition	2	5	7	
Care method of facility	Good relationship between care staff and residents	39	81	120	
	Many in-house events	13	35	48	
	Cared well by a sufficient number of staff	17	23	40	
	Spend own time relatively freely	10	25	35	34.6
	Many opportunities for going out	8	27	35	
	Good relationship with hospitals	9	16	25	
	The facility is a unit care type	11	3	14	
Concern about meal	Meals are delicious	44	81	125	
	Free to take snacks and alcoholic drinks	14	27	41	22.9
	Tastes and preferences of meal are well reflected	11	27	38	
	Residents can take part in cooking	2	4	6	
Environment of facility	Well-equipped facility	8	12	20	
	Located in a good natural environment	6	23	29	6.8
	Shops and restaurants are close by	1	7	8	
	Public transport is convenient	0	5	5	
Total		309	607	916	100

Respondents were asked to choose up to five from among the above 20 options

"Resident's good mental health condition" were the highest in terms of total numbers. Therefore, it was suggested that "Resident's good health", "Delicious meal", and "Good relationship between care staff and residents" were the important factors for residents' improved QOL. In addition, "the things that are believed to be better for resident's QOL and satisfaction", "the things to be proud of other facilities", and "the things to be recommended to other facilities other than the 20 selection factors" were asked as a free comment. The most common answer was "Individual care for residents" (76 facilities). "Individual care for residents" is one of the key themes for unit care defined by the Ministry of Health, Labour and Welfare. To achieve nutritional improvement and better QOL, the answers suggest that "Individual care of meal preparation for the resident" is important.

Conclusions

A questionnaire study was conducted with dietitians and registered dietitians at special nursing homes for the elderly in the Kinki district to compare the dietary environments of the unit care type and conventional type of facility. The ratio of unit care type facilities was 33.5%, and that of the conventional type was 66.5 % . When the dietary environment of the unit care type was compared with that of the conventional type, there was a significant difference with "Is the menu posted?", "Is the dining area fixed?", "Is the starting time of the meal fixed?", and "How many people talk while eating?" The results suggest that in the unit care type, the place and starting time of the meal are fairly flexible, and that more people talk while eating. Furthermore, the unit care type is more like home because some of the tableware is used only by the individual.

There was a higher number of unit care type facilities with kitchens where the resident could take part in the cooking compared with the conventional type facilities. However, 36.4% of the unit care type facilities with kitchens in the living unit were not being used. These facilities seem to do the cooking in a large-scale cooking room (and then bring meals to each unit), which is the same as the conventional type facility. Considering the effect of CWLU, it is highly desirable to have a well-considered care plan using the kitchen for the elderly. It is necessary to solve the problems of "There was a risk of accident and injury" and "Issues on hygiene aspects" when the residents take part in cooking in a unit. It was reported that more staff are necessary than the standard number defined by the law to carry out the individual care in unit care type facilities[17]. Provision of additional staff and the improvement of working conditions are needed from the government.

When the question about the improvement of residents' QOL was asked, there was little difference among the answers for both the unit care and the conventional type facilities. "Resident's good health", "Delicious meal", and "Good relationship between care staff and residents" were suggested as the important factors for residents' improved QOL. In addition, it was shown that improvement of residents' QOL was achieved not because of the unit care type facility itself, but the care method delivered.

The Ministry of Health, Labour and Welfare is recommending the maintenance of unit care type nursing homes. When considering the dietary environment for the nutritional improvement and better QOL of the residents in the unit care type special nursing homes for the elderly, it is important to develop nursing methods that make effective use of facilities such as CWLU. In addition, it is necessary to increase the number of staff in order to perform the individual care more effectively and sufficiently.

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