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Original Article

Mealtime assistance and caregivers' frequency of checking the residents in nursing homes: a questionnaire survey

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Abstract
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Objective: Based on a questionnaire survey of caregivers in nursing homes, this study aimed to describe 1) the caregivers' basic characteristics, 2) the current mealtime assistance settings, and 3) the differences in the frequency of checking the residents during general care as well as before, during, and after mealtime assistance according to the caregivers' experience of attending lectures, their profession, and gender.
Methods: A questionnaire survey was distributed to 18 nursing homes in Ibaraki Prefecture in Japan and caregivers currently providing mealtime assistance answered the questions.
Results: Out of 695 distributed questionnaire surveys, 493 were answered (return rate: 70.9%). The majority of respondents were female (70.9%) and were care workers (78.7%). Most of them felt anxious about mealtime assistance. There were differences in the frequency of checking the residents according to the caregivers' experience of attending lectures, their profession (nurses or care workers), and gender.
Conclusions: To provide mealtime assistance in a safe and relaxed environment, the nursing home managers need to offer psychological support to the nursing home staff. In addition, it is important to provide lectures that take into account the caregivers' professions and genders.
Key words: nursing homes, mealtime assistance, dysphagia, elderly, elder care

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Introduction

Swallowing dysfunctions, often called dysphagia, commonly occur following stroke and age-associated diseases. Many nursing home residents are survivors of related diseases and it is estimated that more than 40% have some dysphagia symptoms [1]. Providing meals not only supplies the necessary nutrition and calories for such residents but also offers the chance for swallowing rehabilitation through the oral intake of food. Moreover, providing meals with the appropriate food texture can prevent the residents from developing aspiration pneumonia. In Japan, no specific license or experience is required for offering mealtime assistance to residents; therefore, the skills and knowledge regarding mealtime assistance may differ among caregivers.

In this study, we distributed questionnaire surveys to caregivers in nursing homes who are usually engaged in mealtime assistance and analyzed the data in terms of the following three aspects: 1) the caregivers' basic characteristics, 2) the current mealtime assistance settings, and 3) the differences in the frequency of checking the residents during general care as well as before, during, and after mealtime assistance according to the caregivers' experience of attending lectures, their profession, and gender.

Methods

A questionnaire-based survey was conducted in 18

nursing homes that accommodated elderly people with physical and psychological disabilities in Ibaraki Prefecture, Japan. The target population was caregivers who were regularly in charge of mealtime assistance for the residents irrespective of their profession and employment status. During the survey period (October 2014 to March 2015), caregivers answered the questionnaire at any time and returned it to a box that we collected after the survey period. This study was performed with the approval of the Institutional Review Board of the University of Tsukuba (No. H24-904).

Two types of questionnaires were distributed to each nursing home: facility characteristics and caregivers' mealtime assistance. In the first questionnaire, we asked the facility managers to describe their nursing home's basic features. The second questionnaire was distributed to each caregiver by the facility managers. It contained four main questions about 1) the caregivers' basic characteristics, 2) the current mealtime assistance settings (i.e., number of residents, average time spent during mealtime assistance, and experience of risky incidents when serving meals), 3) checklists of residents' conditions, and 4) caregivers' experience of attending lectures about mealtime assistance. Regarding their profession, since some caregivers had more than one license, we categorized them as follows. Caregivers with nurse or assistant nurse licenses were categorized as "nurses;" caregivers with any type of care work license other than nurse were categorized as "care workers;" caregivers with any other license, such as social worker or nutritionist, were considered "other license;" and caregivers without any care work license were categorized as "no license."

Questions about the mealtime care settings included, for example, the number of residents for whom the caregiver provided mealtime assistance and if the caregiver had experienced any anxious or risky incidents during mealtime assistance. Furthermore, to examine the differences in the frequency of checking residents during mealtime assistance, we asked how often the caregiver checked the residents' condition during general care as well as before, during, and after mealtime assistance. Caregivers responded using four choices: "1. Often," "2. Sometimes," "3. Rarely," and "4. Not at all." For the purpose of the analysis, we recategorized the choices into three by combining "2. Sometimes" and "3. Rarely." The checklist was created with the help of nurses who specialize in dysphagia and related references [2–4]. The numbers of items on the checklist for general care, and before, during, and after mealtime assistance, were 11, 8, 14, and 7, respectively.

Additionally, we analyzed the differences in the frequency of checking residents according to the caregivers' characteristics. This study focused especially on the differences according to 1) their experience of attending lectures about mealtime assistance, 2) their caregivers' profession, 3) if they were nurses or care workers specifically, and 4) gender.

For all analyses, Pearson's χ^2 test was performed and all statistical analyses were conducted using Stata software, version 13 (StataCorp, Texas, USA).

Results

A total of 695 questionnaires were distributed to 18 nursing homes and 493 were returned (return rate: 70.9%). The results of the facility and respondents' characteristics are summarized in Table 1.

Out of the 18 nursing homes, 14 were welfare facilities (WF) for the elderly requiring long-term care and four were geriatric health service facilities (GH). These nursing homes accommodated 67.3 ± 18.8 elderly residents on average and the number of residents was smaller in the WF (59.4 ± 11.7) compared to the GH (95.0 ± 10). According to a national survey [5], the average number of residents is 72.3 in WF and 89.2 in GH; therefore, the number of residents in the WF was slightly smaller than the national average and that in the GH was slightly larger. The average age of the residents was 86.0 ± 1.2 years and the residents in the WF were relatively older (86.4 ± 0.9) than those in the GH (84.7 ± 1.4). The number of residents using feeding tubes was about four in each facility.

Regarding the respondents' demographic characteristics, 70.9% were female and most had some type of caregiving certificate. In detail, the majority (78.7%) had a license as a care worker and 4.2% did not possess any caregiving license. More than half (57.5%) were aged between 30 and 40 years and caregivers with nurse certificates were likely to be older than those in other professions. The average work experience was 8.1 ± 6.2 years (a range of one month to 38.5 years).

Regarding the average time spent on mealtime assistance (Table 2), 68.6% of the respondents spent 15–30 minutes per resident and 96% finished the assistance within 45 minutes. In both the unit-type and general-type rooms, many respondents served the meals for approximately two residents simultaneously. Ninety percent served less than three residents and it was rare for them to serve more than four respondents at the same time. Regarding staffing at the nursing homes, the staff-resident ratio was the same for both the unit-type and general-type rooms. Although a study [6] shows that caregivers are likely to serve a lower number of residents in the unit-type rooms than in the general-type rooms, the present stady found no significant difference in staffing for meal assistance in both types of rooms.

As for experience attending lectures (Table 3), almost half the respondents (54.7%) had attended lectures about mealtime assistance before being employed in the nursing homes. Among them, respondents with other licenses had attended lectures

Table 1. Facility and respondents' characteristics.

Nursing Homes		Overall (n = 18)	WF* (n = 14)	GH** (n = 4)		
Number of Residents, mean ± SD		67.3 ± 18.8	59.4 ± 11.7	95 ± 10.0		
	Min	50	50	80		
	Max	100	82	100		
Age of Residents, mean ± SD		86.0 ± 1.2	86.4 ± 0.9	84.7 ± 1.4		
Residents Using Feeding Tubes, mean±SD		4.1 ± 2.4	4.0 ± 2.7	4.5 ± 1.9		
Respondents' Characteristics		Overall (n = 493)	Nurse (n = 55)	Care Worker (n = 388)	Other Licenses (n = 14)	No License (n = 22)
Female, n (%)[1]		344 (70.9)	53 (96.4)	264 (68.2)	9 (64.3)	12 (54.6)
Age, n (%)[2]	10s	3 (0.6)	0 (0.0)	2 (0.5)	0 (0.0)	1 (4.6)
	20s	104 (21.5)	1 (1.8)	94 (24.4)	2 (14.3)	7 (31.8)
	30s	164 (33.9)	13 (23.6)	134 (34.7)	8 (57.1)	7 (31.8)
	40s	114 (23.6)	12 (21.8)	95 (24.4)	2 (14.3)	5 (22.7)
	50s	74 (15.3)	21 (38.2)	47 (12.1)	2 (14.3)	2 (9.1)
	60s and Over	25 (5.2)	8 (14.6)	15 (3.9)	0 (0.0)	0 (0.0)
Employment, n (%)[3]	Full-time	389 (80.2)	34 (61.8)	317 (82.1)	13 (92.9)	20 (90.9)
	Part-time/Other	96 (19.8)	21 (38.2)	69 (17.9)	1 (7.1)	2 (9.1)
Work Experience (Years), mean ± SD[4]		8.1 ± 6.2	15.1 ± 10.3	7.4 ± 4.8	7.4 ± 6.8	5.2 ± 4.9
	Less than 5 years	28 (6.0)	11 (22.5)	135 (35.9)	7 (58.3)	15 (71.4)
	More than 30 years	7 (1.4)	7 (14.3)	0 (0.0)	0 (0.0)	0 (0.0)

Missing Values: 1. n = 8 (1.6%), 2. n = 16 (3.2%), 3. n = 8 (1.6%), 4. n = 28 (5.7%).
*WF: Welfare facilities for the elderly requiring long-term care
**GH: Geriatric health service facilities

most frequently (78.6%) and those with no license were least likely to have attended such lectures (18.2%) before starting their job.

Compared to their lecture attendance before starting their job, respondents had less chance of having such an experience after being employed (38.7%). As for lecture attendance before being employed, the most frequent attendees were respondents with other licenses (78.6%) and the least were respondents with no license (27.3%). There was not much difference in the attendance between nurses (38.2%) and care workers (37.1%). Among those who attended lectures before and/or after being employed, almost half attended lectures about emergency care. In addition, over half (53.4%) attended lectures about suctions and this topic was most popular among nurses (76.4%) and care workers (50.3%).

Of the respondents, 71.2% had experienced risky incidents and 74.4% had felt anxious while serving meals to the residents. Considering the relationship between the experience of attending lectures and anxious feelings while serving meals (Table 4), respondents with experience of attending lectures felt more nervous about serving meals compared to those who had not attended lectures, and this relationship was found both before and after being employed.

Next, we investigated whether the frequency of checking the residents' condition varied in four situations: in general care, and before, during, and after mealtime assistance (Table 5). In each, if the percentage of respondents who answered "often" was more than 80%, these items were categorized as "highly checked." If the percentage was between 60% and 80%, the items were categorized as "mostly checked" and items with less than 60% were categorized as "less checked." Furthermore, the results showed the most and least checked items.

Regarding general care, two out of eleven items (18.2%) were categorized as highly checked. The behavior that the caregivers checked the most was swallowing (90.6%) and the least was age (25.1%). Regarding before mealtime assistance, three out of eight items (37.5%) were categorized as highly checked. Alertness was often checked (91.5%) but the amount of activity during the day was not well checked (15.7%). Regarding assistance during mealtime, nine out of fourteen items (64.3%) were categorized as highly checked and this percentage was highest in all situations. This means that respondents were most careful about checking their residents during mealtime assistance. Of the respondents, 97% checked their alertness, and drooling was least frequently checked; however, even drooling was checked by more than half the respondents (58.7%). Regarding assistance

Table 2. Mealtime assistant settings.

	Overall (n = 456)	Nurse (n = 47)	Care Worker (n = 374)	Other Licenses (n = 13)	No License (n = 22)	χ^2 test
Average time spent on mealtime assistance (per resident)[1], n (%)						$p < 0.05$
< 15 minutes	63 (13.8)	12 (25.5)	42 (11.2)	1 (7.7)	8 (36.4)	
15–30 minutes	313 (68.6)	25 (53.2)	270 (72.2)	9 (69.2)	9 (40.9)	
30–45 minutes	64 (14.0)	6 (12.8)	50 (13.4)	3 (23.1)	5 (22.7)	
45–60 minutes	13 (2.9)	4 (8.5)	9 (2.4)	0 (0.0)	0 (0.0)	
> 60 minutes	1 (0.2)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	
other	2 (0.4)	0 (0.0)	2 (0.5)	0 (0.0)	0 (0.0)	
Number of residents to be served meals, n (%)						
Unit-type room	Overall (n = 280)	Nurse (n = 25)	Care Worker (n = 231)	Other Licenses (n = 8)	No License (n = 16)	n.s.
1 resident	110 (39.3)	8 (32.0)	89 (38.5)	5 (62.5)	8 (50.0)	
2 residents	115 (41.1)	12 (48.0)	94 (40.7)	3 (37.5)	6 (37.5)	
3 residents	32 (11.4)	3 (12.0)	28 (12.1)	0 (0.0)	1 (6.3)	
4 residents	11 (3.9)	1 (4.0)	9 (3.9)	0 (0.0)	1 (6.3)	
5 residents	7 (2.5)	0 (0.0)	7 (3.0)	0 (0.0)	0 (0.0)	
> 6 residents	5 (1.8)	1 (4.0)	4 (1.7)	0 (0.0)	0 (0.0)	
General-type room	Overall (n = 280)	Nurse (n = 30)	Care Worker (n = 179)	Other Licenses (n = 4)	No License (n = 10)	n.s.
1 resident	67 (30.0)	16 (53.3)	45 (25.1)	2 (50.0)	4 (40.0)	
2 residents	106 (47.5)	9 (30.0)	92 (51.4)	2 (50.0)	3 (30.0)	
3 residents	34 (15.3)	3 (10.0)	29 (16.2)	0 (0.0)	2 (20.0)	
4 residents	4 (1.8)	1 (3.3)	2 (1.1)	0 (0.0)	1 (10.0)	
5 residents	4 (1.8)	0 (0.0)	4 (2.2)	0 (0.0)	0 (0.0)	
>6 residents	8 (3.6)	1 (3.3)	7 (3.9)	0 (0.0)	0 (0.0)	

Missing value: 1. n = 23 (4.8%).

Table 3. Experience attending lectures about mealtime assistance.

Lecture Attendance	Before Starting Job	After Starting Job	Emergency Care[*1]	Suction
Overall (n = 464), n (%)	254 (54.7)	180 (38.7)	144 (45.6)	249 (53.7)
Nurse	29 (52.7)	21 (38.2)	17 (30.9)	42 (76.4)
Care Worker	210 (54.1)	144 (37.1)	116 (29.9)	195 (50.3)
Other Licenses	11 (78.6)	9 (64.3)	7 (50.0)	5 (35.7)
No License	4 (18.2)	6 (27.3)	4 (18.2)	7 (31.8)
χ^2 test[*2]	$p < 0.05$	n.s.	n.s.	$p < 0.01$

*1. We asked this question only for respondents who attended lectures before and/or after starting their job.
*2. Statistical analysis was performed among professions.

Table 4. Lecture attendance and anxiety about serving meals.

Experience Attending Lectures	Anxious Feelings while Serving Meals	
	Not Feeling Anxious	Feeling Anxious
Before Starting Job (n = 452), n (%)		
Never	64 (31.2)	141 (68.8)
Attended	53 (21.5)	194 (78.5)
After Starting Job (n = 451), n (%)		
Never	86 (31.4)	188 (68.6)
Attended	28 (15.8)	149 (84.2)

Table 5. Frequency of checking the residents' condition.

	Number of Items	Frequency of Checking			Most and Least Checked Items	
		Highly Checked	Mostly Checked	Less Checked	Most Checked Item	Least Checked Item
General Care, *n* (%)	11	2 (18.2)	3 (27.3)	6 (54.6)	Swallowing (90.6%)	Age (25.1%)
Before Mealtime Assistance, *n* (%)	8	3 (37.5)	0 (0.0)	5 (62.5)	Alertness (91.5%)	Activity (15.7%)
During Mealtime Assistance, *n* (%)	14	9 (64.3)	4 (28.6)	1 (7.1)	Alertness (97.3%)	Drooling (58.7%)
After Mealtime Assistance, *n* (%)	7	2 (28.6)	3 (42.9)	2 (28.6)	Residue (97.3%)	Regurgitation (43.6%)

after mealtime, two out of seven (28.6%) items were categorized as highly checked. Residue in the mouth was well checked by the respondents (97.3%) but regurgitation (43.6%) was less likely to be checked.

We also compared the frequency of checking between the respondents who had attended lectures before and/or after being employed and those who had never done so (Tables 6–9). For general care, no item was statistically different between these two groups in terms of checking frequency, but three items (coughing during the night, nighttime sleeping, and health condition) before mealtime assistance, one item (coughing [from liquids]) during mealtime assistance, and five items (breathing, phlegm in the throat, choking, residue in the mouth, and feelings) after mealtime assistance were statistically different between the two groups. Among all the items, except for two (coughing during the night and nighttime sleeping), the respondents who had attended lectures were more likely to check the residents.

We also analyzed the differences in the frequency of checking among the professions (nurses, care workers, other licenses, and no license) but no items were statistically significant in any situation. In a further analysis, we focused on nurses and care workers who were mainly involved in mealtime assistance in the nursing homes to see if there were differences in now freguently they check their residents (Tables 6–9). Since 52 out of 55 respondents with a nurse certificate were female (96.4%) and the gender bias needed to be corrected, only female respondents were included in the analysis. As a result, three items (medical history, history of aspiration pneumonia, and infections), one item (coughing during the night), two items (alertness and appetite), and one item (regurgitation) were statistically different during general care, and before, during, and after mealtime assistance respectively, and nurses were more likely to check the residents for all these items.

Finally, we investigated if there were differences in the checking frequency by gender (Tables 6–9) even within the same profession. Among the four professions, care workers were selected for the analysis since their number was the largest in our data and the proportion of female and male care workers was relatively even compared to the others. As a result, three items (food preference, amount of food intake, and infections), one item (alertness), nine items (response, appetite, posture, assistance level, coughing [from solids], coughing [from liquids], residue in the mouth, difficulty chewing, and food spilling from the mouth), and six items (phlegm in the throat, longer mealtime duration, regurgitation, choking, residue in the mouth, and feelings) were statistically different during general care, and before, during, and after mealtime assistance respectively. We found that female care workers were more likely to check the residents for these items.

Discussion

Based on the questionnaire survey, this study identified the basic characteristics of caregivers who provide mealtime assistance in nursing homes, the current mealtime care settings, and the differences in the frequency of checking residents according to the caregivers' characteristics.

Overall, caregivers were less likely to check the items listed during general care, compared to before, during, and after mealtime assistance. The reason could be that most of the general care items comprised basic information about the residents that had not significantly changed (e.g., age) or the caregivers were already aware of the information (e.g., medical history), and they therefore did not answer "often" in the questionnaire. Apparently, "Swallowing," which can change often on a daily basis, was an item frequently checked by the respondents.

Both before and after mealtime assistance, the residents' alertness was well checked and caregivers seemed to understand the importance of the residents' response levels during mealtime. On the contrary, the percentage of caregivers who checked the residents' amount of activity before mealtime assistance was the lowest among all listed items. If the caregivers do not grasp the resident's daily activities and do not provide enough food based on the activity level, the resident may suffer from malnutrition or sarcopenia [7]. In this sense, checking the amount of activity is critical. However, the questionnaire asked if caregivers checked the "amount of activity" and they might have understood this to mean that they should know the amount on a quantitative scale. Thus, it is possible that they did not answer "often" and the percentage

Table 6. Frequency of checking during general care.

		Lecture Attendance* (n = 453)		χ^2 test	Nurse/Care Worker (n = 317)		χ^2 test	Care Worker (n = 388)		χ^2 test
		Attended	Never		Nurse	Care Worker		Male	Female	
1 Age	Often	83 (26.4)	32 (23.2)		18 (40.0)	59 (23.5)		26 (21.3)	59 (23.5)	
	Sometimes	209 (66.6)	93 (67.4)	n.s.	24 (53.3)	179 (71.3)	n.s.	81 (66.4)	179 (71.3)	n.s.
	Not at all	22 (7.0)	13 (9.4)		3 (6.7)	13 (5.2)		15 (12.3)	13 (5.2)	
2 Medical History	Often	136 (42.6)	52 (37.4)		28 (62.2)	96 (37.5)		45 (36.6)	96 (37.5)	
	Sometimes	174 (54.6)	83 (59.7)	n.s.	17 (37.8)	156 (60.9)	$p < 0.01$	72 (58.5)	156 (60.9)	n.s.
	Not at all	9 (2.8)	4 (2.9)		0 (0.0)	4 (1.6)		6 (4.9)	4 (1.6)	
3 Swallowing	Often	294 (91.3)	126 (90.0)		246 (93.2)	18 (6.8)		107 (87.0)	246 (93.2)	
	Sometimes	27 (8.4)	14 (10.0)	n.s.	4 (8.7)	4 (8.7)	n.s.	15 (12.3)	18 (6.8)	n.s.
	Not at all	1 (0.3)	0 (0.0)		0 (0.0)	0 (0.0)		1 (0.8)	0 (0.0)	
4 Food Preference	Often	93 (29.3)	33 (23.4)		14 (30.4)	76 (29.7)		27 (21.8)	76 (29.7)	
	Sometimes	215 (67.6)	100 (70.9)	n.s.	32 (69.6)	175 (68.4)	n.s.	86 (69.4)	175 (68.4)	$p < 0.01$
	Not at all	10 (3.1)	8 (5.7)		0 (0.0)	5 (2.0)		11 (8.9)	5 (2.0)	
5 Food Texture	Often	259 (80.4)	97 (71.3)		388(80.9)	210 (81.7)		89 (71.8)	210 (81.7)	
	Sometimes	59 (18.3)	37 (27.2)	n.s.	9 (19.2)	45 (17.5)	n.s.	33 (26.6)	45 (17.5)	n.s.
	Not at all	4 (1.2)	2 (1.5)		0 (0.0)	2 (0.8)		2 (1.6)	2 (0.8)	
6 Aspiration Pneumonia	Often	166 (52.2)	63 (46.0)		30 (66.7)	119 (46.7)		63 (50.8)	119 (46.7)	
	Sometimes	142 (44.7)	67 (48.9)	n.s.	15 (33.3)	129 (50.6)	$p < 0.05$	54 (43.6)	129 (50.6)	n.s.
	Not at all	10 (3.1)	7 (5.1)		0 (0.0)	7 (2.8)		7 (5.7)	7 (2.8)	
7 Amount of Food Intake	Often	230 (71.9)	99 (70.2)		39 (83.0)	189 (73.0)		79 (63.7)	189 (73.0)	
	Sometimes	88 (27.5)	41 (29.1)	n.s.	8 (17.0)	70 (27.0)	n.s.	43 (34.7)	70 (27.0)	$p < 0.05$
	Not at all	2 (0.6)	1 (0.7)		0 (0.0)	0 (0.0)		2 (1.6)	0 (0.0)	
8 Weight Changes	Often	96 (30.0)	43 (30.5)		21 (45.7)	75 (28.9)		31 (25.0)	75 (28.9)	
	Sometimes	217 (67.8)	95 (67.4)	n.s.	25 (54.4)	182 (70.0)	n.s.	89 (71.8)	182 (70.0)	n.s.
	Not at all	7 (2.2)	3 (2.1)		0 (0.0)	3 (1.2)		4 (3.2)	3 (1.2)	
9 Infections	Often	113 (35.8)	50 (35.7)		24 (52.2)	84 (33.2)		41 (33.1)	84 (33.2)	
	Sometimes	188 (59.5)	79 (56.4)	n.s.	21 (45.7)	163 (64.4)	$p < 0.05$	68 (54.8)	163 (64.4)	$p < 0.01$
	Not at all	15 (4.8)	11 (7.9)		1 (2.2)	6 (2.4)		15 (12.1)	6 (2.4)	
10 Care Level**	Often	102 (31.9)	36 (25.7)		17 (36.2)	74 (28.9)		38 (30.7)	74 (28.9)	
	Sometimes	200 (62.5)	94 (67.1)	n.s.	26 (55.3)	170 (66.4)	n.s.	76 (61.3)	170 (66.4)	n.s.
	Not at all	18 (5.6)	10 (7.1)		4 (8.5)	12 (4.7)		10 (8.1)	12 (4.7)	
11 Cognitive Functions	Often	181 (56.7)	70 (50.0)		32 (68.1)	133 (52.2)		62 (50.0)	133 (52.2)	
	Sometimes	133 (41.7)	66 (47.1)	n.s.	14 (29.8)	119 (46.7)	n.s.	58 (46.8)	119 (46.7)	n.s.
	Not at all	5 (1.6)	4 (2.9)		1 (2.1)	3 (1.2)		4 (3.2)	3 (1.2)	

* "n" shows the total number of respondents who attended lectures. Number of respondents is different in each item since missing values exist in each list.

** Level of required care certified by long-term care insurance system.

decreased.

Caregivers were likely to check the residents for most of the listed items during mealtime assistance. This finding implies that caregivers pay considerable attention to the residents while serving meals.

When comparing the checking frequency between nurses and care workers, nurses tended to check medical-related items more, such as the resident's medical history, history of aspiration pneumonia, and infections. The reason this percentage is higher is because these items are strongly related to the nurse's daily job.

Currently, mealtime assistance is provided by people in various professions, including caregivers with no health or medical-related licenses, but each profession has a certain role in mealtime assistance according to the person's specialty [8]. There are knowledge and skills that all caregivers should have and that are provided by the professions so that meals can be served safely with a multidisciplinary perspective. Studies have reported [9, 10] that multidisciplinary care teams can provide ward rounds for suspected dysphagia patients in hospitals and this team care contributes to improving their swallowing ability. Such treatment can be applied to nursing home residents.

This study also shows that there are differences in the checking frequency by gender even within the same profession; that is, care workers. Female care workers are more likely than their male counterparts to check the residents in general care and during mealtime

Table 7. Frequency of checking before mealtime assistance.

		Lecture Attendance		χ^2 test	Nurse/Care Worker		χ^2 test	Care Worker		χ^2 test
		Attended	Never		Nurse	Care Worker		Male	Female	
1 Oral Hygiene	Often	99 (30.6)	45 (33.3)	n.s.	22 (45.8)	85 (33.1)	n.s.	31 (25.4)	85 (33.1)	n.s.
	Sometimes	212 (65.4)	78 (57.8)		25 (52.1)	163 (63.4)		81 (66.4)	163 (63.4)	
	Not at all	13 (4.0)	12 (8.9)		1 (2.1)	9 (3.5)		10 (8.2)	9 (3.5)	
2 Dentures	Often	276 (84.9)	111 (78.7)	n.s.	40 (83.3)	220 (83.3)	n.s.	101 (82.1)	220 (83.3)	n.s.
	Sometimes	47 (14.5)	27 (19.2)		8 (16.7)	41 (15.5)		20 (16.3)	41 (15.5)	
	Not at all	2 (0.6)	3 (2.1)		0 (0.0)	3 (1.1)		2 (1.6)	3 (1.1)	
3 Coughing During Night	Often	70 (22.1)	41 (30.8)	$p < 0.01$	23 (50.0)	58 (23.2)	$p < 0.01$	24 (19.7)	58 (23.2)	n.s.
	Sometimes	226 (71.3)	75 (56.4)		21 (45.7)	174 (69.6)		85 (69.7)	174 (69.6)	
	Not at all	21 (6.6)	17 (8)		2 (4.4)	18 (7.2)		13 (10.7)	18 (7.2)	
4 Constipation	Often	141 (43.8)	76 (53.9)	n.s.	28 (58.3)	113 (43.3)	n.s.	55 (45.1)	113 (43.3)	n.s.
	Sometimes	173 (53.7)	61 (43.3)		20 (41.7)	144 (55.2)		60 (49.2)	144 (55.2)	
	Not at all	8 (2.5)	4 (2.8)		0 (0.0)	4 (1.5)		7 (5.7)	4 (1.5)	
5 Amount of Activity	Often	40 (12.5)	28 (20.4)	n.s.	13 (27.7)	40 (15.7)	n.s.	15 (12.2)	40 (15.7)	n.s.
	Sometimes	246 (77.1)	96 (70.1)		33 (70.2)	194 (76.1)		90 (73.2)	194 (76.1)	
	Not at all	33 (10.3)	13 (9.5)		1 (2.1)	21 (8.2)		18 (14.6)	21 (8.2)	
6 Nighttime Sleeping	Often	125 (39.2)	61 (45.2)	$p < 0.05$	24 (52.2)	102 (40.2)	n.s.	47 (38.5)	102 (40.2)	n.s.
	Sometimes	185 (58.0)	65 (48.2)		21 (45.7)	142 (55.9)		69 (56.6)	142 (55.9)	
	Not at all	9 (2.8)	9 (6.7)		1 (2.2)	10 (3.9)		6 (4.9)	10 (3.9)	
7 Health Condition	Often	279 (86.1)	106 (75.7)	$p < 0.05$	45 (91.8)	222 (84.4)	n.s.	99 (84.4)	222 (84.4)	n.s.
	Sometimes	43 (13.3)	34 (24.3)		4 (8.2)	41 (15.6)		22 (17.9)	41 (15.6)	
	Not at all	2 (0.6)	0 (0.0)		0 (0.0)	0 (0.0)		2 (1.6)	0 (0.0)	
8 Alertness	Often	300 (92.6)	125 (88.7)	n.s.	46 (95.8)	251 (94.7)	n.s.	102 (82.9)	251 (94.7)	$p < 0.01$
	Sometimes	23 (7.1)	16 (11.4)		2 (4.2)	14 (5.3)		20 (16.3)	14 (5.3)	
	Not at all	1 (0.3)	0 (0.0)		0 (0.0)	0 (0.0)		1 (0.8)	0 (0.0)	

assistance. Among the items, some are especially crucial for avoiding aspiration pneumonia and choking, such as alertness before mealtime assistance, and the resident's response, posture, and coughing during mealtime assistance. Thus, the reason why such differences exist should be more carefully investigated. One possibility is that females are more involved in child and elder care in their private lives; therefore, they have learned related skills through their own life experiences.

Regarding experience attending lectures about mealtime assistance, caregivers who had not attended lectures were less likely to check the residents' condition compared to those who had attended lectures before and/or after being employed. Since the lectures often provide detailed information on the items to be given careful attention during mealtime assistance, caregivers who have experience attending lectures may know exactly what points they should check for with the residents, and the frequency of checking the listed items became higher as a result.

Additionally, the study revealed that caregivers had more opportunities to attend such lectures before being employed and the percentage of lecture attendance became lower after they started working at the nursing homes. Moreover, caregivers without any license had less chance to attend lectures.

Many caregivers had experienced risky incidents while serving meals and felt anxious about providing assistance. The results also showed that caregivers who attended lectures felt more anxious about mealtime assistance compared to those who had never attended lectures. The reason may be that caregivers were more aware of the risks involved in serving meals to the elderly, such as aspiration or choking, through the lectures. They may also have felt anxious about whether they could properly provide the care that they had learned about during the lectures. Feeling anxious is not always disadvantageous for care. For instance, near-miss incidents, called *hiyari hatto* in Japanese, are medical incidents where the consequences are not critical but could hurt the patient. Such anxious feelings are important to prevent critical incidents but excessive anxiety can be a burden for the caregivers. A study shows [11] that experiencing unexpected and stressful incidents influences the performance of mealtime assistance and caregivers experience a dilemma between professional ethics to protect the residents' lives and the residents' purpose for eating. If caregivers prioritize the safety of eating to protect the residents' lives, they suffer from not being able to give the residents the chance to enjoy their meals. In addition, the residents may not be satisfied with their quality of life. One solution could be to provide caregivers with enough psychological and technical support to help them feel more confortable about serving meals to the residents.

Table 8. Frequency of Checking During Mealtime Assistance.

		Lecture Attendance			Nurse/Care Worker			Care Worker		
		Attended	Never	χ^2 test	Nurse	Care Worker	χ^2 test	Male	Female	χ^2 test
1 Alertness	Often	316 (97.8)	137 (95.8)		47 (97.9)	258 (97.4)		121 (97.6)	258 (97.4)	
	Sometimes	6 (1.9)	6 (4.2)	n.s.	0 (0.0)	7 (2.6)	$p < 0.05$	3 (2.4)	7 (2.6)	n.s.
	Not at all	1 (0.3)	0 (0.0)		1 (2.1)	0 (0.0)		0 (0.0)	0 (0.0)	
2 Showing Intention	Often	272 (84.5)	109 (77.3)		44 (91.7)	216 (82.8)		95 (76.6)	216 (82.8)	
	Sometimes	47 (14.6)	29 (20.6)	n.s.	3 (6.3)	42 (16.1)	n.s.	29 (23.4)	45 (17.2)	n.s.
	Not at all	3 (0.9)	3 (2.1)		1 (2.1)	3 (1.2)		0 (0.0)	0 (0.0)	
3 Response	Often	278 (86.3)	116 (81.7)		43 (91.5)	230 (87.5)		94 (75.8)	230 (87.5)	
	Sometimes	38 (11.8)	24 (16.9)	n.s.	3 (6.4)	31 (11.8)	n.s.	30 (24.2)	33 (12.6)	$p < 0.01$
	Not at all	6 (1.9)	2 (1.4)		1 (2.1)	2 (0.8)		0 (0.0)	0 (0.0)	
4 Appetite	Often	266 (82.4)	107 (74.8)		40 (83.3)	219 (82.6)		90 (72.6)	219 (82.6)	
	Sometimes	54 (16.7)	32 (22.4)	n.s.	6 (12.5)	45 (16.9)	$p < 0.05$	34 (27.4)	46 (17.4)	$p < 0.05$
	Not at all	3 (0.9)	4 (2.8)		2 (4.2)	1 (0.4)		0 (0.0)	0 (0.0)	
5 Drooling	Often	196 (61.1)	38 (27.3)		36 (75.0)	152 (59.1)		64 (52.0)	152 (59.1)	
	Sometimes	91 (28.4)	24 (17.3)	n.s.	7 (14.6)	74 (28.8)	n.s.	56 (45.5)	104 (40.5)	n.s.
	Not at all	31 (9.7)	3 (2.2)		4 (8.3)	30 (11.7)		3 (2.4)	1 (0.4)	
6 Posture	Often	296 (91.4)	124 (86.7)		44 (89.8)	244 (92.1)		106 (85.5)	244 (92.1)	
	Sometimes	28 (8.6)	19 (13.3)	n.s.	5 (10.2)	21 (7.9)	n.s.	18 (14.5)	21 (7.9)	$p < 0.05$
	Not at all	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
7 Assistance Level	Often	249 (77.3)	112 (78.9)		38 (79.2)	214 (81.7)		86 (69.4)	214 (81.7)	
	Sometimes	73 (22.7)	30 (21.1)	n.s.	10 (20.8)	48 (18.3)	n.s.	38 (30.6)	48 (18.3)	$p < 0.01$
	Not at all	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
8 Coughing [From Solids]	Often	299 (92.3)	130 (90.9)		46 (93.9)	249 (94.0)		108 (87.1)	249 (94.0)	
	Sometimes	25 (7.7)	12 (8.4)	n.s.	3 (6.1)	16 (6.0)	n.s.	15 (12.1)	16 (6.0)	$p < 0.05$
	Not at all	1 (0.2)	1 (0.7)		0 (0.0)	0 (0.0)		1 (0.8)	0 (0.0)	
9 Coughing [From Liquids]	Often	306 (94.4)	123 (86.6)		45 (91.8)	248 (93.9)		108 (87.1)	248 (93.9)	
	Sometimes	18 (5.6)	18 (12.7)	$p < 0.01$	4 (8.2)	16 (6.1)	n.s.	15 (12.1)	16 (6.1)	$p < 0.05$
	Not at all	0 (0.0)	1 (0.7)		0 (0.0)	0 (0.0)		1 (0.8)	0 (0.0)	
10 Residue in Mouth	Often	272 (84.0)	123 (86.6)		42 (85.7)	235 (89.0)		94 (76.4)	235 (89.0)	
	Sometimes	52 (16.1)	19 (13.4)	n.s.	7 (14.3)	29 (11.0)	n.s.	29 (23.6)	29 (11.0)	$p < 0.01$
	Not at all	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
11 Difficulty Chewing	Often	229 (70.9)	94 (66.7)		36 (75.0)	188 (72.0)		73 (58.9)	188 (72.0)	
	Sometimes	93 (28.8)	46 (32.6)	n.s.	12 (25.0)	73 (28.0)	n.s.	49 (39.5)	73 (28.0)	$p < 0.01$
	Not at all	1 (0.3)	1 (0.7)		0 (0.0)	0 (0.0)		2 (1.6)	0 (0.0)	
12 Food Spilling from Mouth	Often	236 (73.1)	99 (70.7)		35 (71.4)	197 (75.2)		80 (64.5)	197 (75.2)	
	Sometimes	87 (26.9)	41 (29.3)	n.s.	14 (25.4)	65 (24.8)	n.s.	44 (35.5)	65 (24.8)	$p < 0.05$
	Not at all	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
13 Neck Angle	Often	244 (76.0)	100 (70.4)		37 (77.1)	198 (75.3)		84 (68.3)	198 (75.3)	
	Sometimes	76 (23.7)	41 (28.9)	n.s.	11 (22.9)	65 (24.7)	n.s.	38 (30.9)	65 (24.7)	n.s.
	Not at all	1 (0.3)	1 (0.7)		0 (0.0)	0 (0.0)		1 (0.8)	0 (0.0)	
14 Pace of Eating	Often	204 (63.8)	87 (60.8)		37 (77.1)	171 (65.0)		64 (52.5)	171 (65.0)	
	Sometimes	115 (35.9)	55 (38.5)	n.s.	11 (22.3)	91 (34.6)	n.s.	57 (46.7)	91 (34.6)	n.s.
	Not at all	1 (0.3)	1 (0.7)		0 (0.0)	1 (0.4)		1 (0.8)	1 (0.4)	

Our study did not investigate the caregivers' degree of anxiety or details of attended lectures. More studies are required to analyze what circumstances the caregivers feel most anxious about and what sort of lectures can help caregivers serve meals to the residents.

To give caregivers more opportunities to attend lectures, facility managers should establish circumstances in which the caregivers can comfortably attend lectures as part of their job. Furthermore, since our study implies that there are gender differences in the frequency of checking residents, the lectures should be sensitive to gender roles and differences in their private experiences. Moreover, lectures are sometimes offered only for specific professions, such as nurses or care workers, so caregivers without any license have less chance of obtaining knowledge and skills through lectures. The lectures should not be targeted to a specific profession, but should take into account these non-licensed caregivers as well.

Table 9. Frequency of checking after mealtime assistance.

		Lecture Attendance		χ^2 test	Nurse/Care Worker		χ^2 test	Care Worker		χ^2 test
		Attended	Never		Nurse	Care Worker		Male	Female	
1 Breathing	Often	240 (75.0)	88 (62.4)		34 (72.3)	169 (64.0)		65 (53.3)	169 (64.0)	
	Sometimes	79 (24.7)	52 (36.9)	$p < 0.05$	11 (23.4)	90 (34.1)	n.s.	51 (41.8)	90 (34.1)	n.s.
	Not at all	1 (0.3)	1 (0.7)		2 (4.3)	5 (1.9)		6 (4.9)	5 (1.9)	
2 Phlegm in Throat	Often	257 (79.8)	102 (71.8)		41 (82.0)	213 (80.7)		84 (68.3)	213 (80.7)	
	0.12 mm	63 (19.6)	35 (24.7)	$p < 0.05$	8 (16.0)	48 (18.2)	n.s.	36 (29.3)	48 (18.2)	$p < 0.05$
	Not at all	2 (0.6)	5 (3.5)		1 (2.0)	3 (1.1)		3 (2.4)	3 (1.1)	
3 Longer Mealtime Duration	Often	143 (44.6)	61 (42.7)		30 (61.2)	121 (46.0)		39 (31.7)	121 (46.0)	
	Sometimes	174 (54.2)	81 (56.6)	n.s.	19 (38.8)	140 (53.2)	n.s.	83 (67.5)	140 (53.2)	$p < 0.05$
	Not at all	4 (1.3)	1 (0.7)		0 (0.0)	2 (0.8)		1 (0.8)	2 (0.8)	
4 Regurgitation	Often	143 (45.0)	59 (42.1)		30 (61.2)	110 (42.6)		47 (38.2)	110 (42.6)	
	Sometimes	164 (51.6)	70 (50.0)	n.s.	17 (34.7)	142 (55.0)	$p < 0.05$	65 (52.9)	142 (55.0)	$p < 0.05$
	Not at all	22 (4.8)	11 (7.9)		2 (4.1)	6 (2.3)		11 (8.9)	6 (2.3)	
5 Choking	Often	276 (85.5)	106 (74.7)		39 (79.6)	225 (84.9)		95 (77.2)	225 (84.9)	
	Sometimes	45 (13.9)	35 (24.7)	$p < 0.05$	10 (20.4)	40 (15.1)	n.s.	26 (21.1)	40 (15.1)	$p < 0.05$
	Not at all	2 (0.6)	1 (0.7)		0 (0.0)	0 (0.0)		2 (1.6)	0 (0.0)	
6 Residue in Mouth	Often	285 (88.0)	110 (76.9)		42 (84.0)	232 (87.2)		100 (81.3)	232 (87.2)	
	Sometimes	38 (14.8)	31 (21.7)	$p < 0.01$	8 (16.0)	34 (12.8)	n.s.	20 (16.3)	34 (12.8)	$p < 0.05$
	Not at all	3 (0.6)	2 (1.4)		0 (0.0)	0 (0.0)		3 (2.4)	0 (0.0)	
7 Feelings	Often	240 (75.0)	88 (62.4)		39 (79.6)	190 (72.8)		75 (61.0)	190 (72.8)	
	Sometimes	79 (24.7)	52 (36.9)	$p < 0.05$	10 (20.4)	71 (27.2)	n.s.	46 (37.4)	71 (27.2)	$p < 0.05$
	Not at all	1 (0.3)	1 (0.7)		0 (0.0)	0 (0.0)		2 (1.6)	0 (0.0)	

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