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Author(s)	Hirata, S; Sakayori, T; Maki, Y; Takano, N; Ishii, T.
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**Original Article**

## **Factor Analysis on Implementation of Domiciliary Dental Care in Metropolitan Tokyo**

**SoIchiro Hirata, Takaharu Sakayori, Yoshinobu Maki,  
Naohisa Takano\* and Takuo Ishii**

*Department of Social Dentistry, Tokyo Dental College,  
1-2-2 Masago, Mihama-ku, Chiba 261-8502, Japan*

*\*Tokyo Dental Association,  
4-1-20 Kudan-kita, Chiyoda-ku, Tokyo 102-0073, Japan*

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### **Abstract**

The need for domiciliary dental care has increased with the aging of Japanese society. The Tokyo Metropolitan Government and Tokyo Dental Association conducted a survey of dental institutions within Tokyo in order to clarify which factors influenced implementation of domiciliary dental care by dental institutions. The proportion was significantly higher in (1) dentists in their 50s or older, (2) those working in cooperation with primary care physicians, (3) those providing dysphagia rehabilitation, (4) those who give information on prevention of aspiration pneumonia, (5) those who attended training on medical or domiciliary dental care for the elderly in need of nursing care, and (6) those who attended training workshops and seminars provided by the Tokyo Dental Association in 2010. In the logistic regression analysis, a significant odds ratio was obtained for the same items, excluding age. Attendance at training on medical or domiciliary dental care for the elderly in need of nursing care had the highest odds ratio. Those who attended any kind of training course implemented domiciliary dental care significantly more often. Training conducted by the Tokyo Metropolitan Center for Oral Health of Persons with Disabilities, Tokyo Dental Association, and local dental associations showed a significant odds ratio, with the highest by the Tokyo Dental Association. Traditionally, education on domiciliary dental care in the elderly is not provided at the college level. The present results indicate the importance of educating students with regard to the unique challenges such work poses. Attending seminars hosted by the Tokyo Dental Association also significantly influenced implementation of domiciliary dental care. This seems to be an important result, suggesting the effectiveness of training provided by dental associations with regard to the promotion of domiciliary dental care. This indicates the need for dental associations to provide such training throughout Japan.

**Key words:** Domiciliary dental care — Japan — Metropolitan Tokyo — Aged society — Life-long training

### **Introduction**

With the increase in the number of elderly

citizens, the need for domiciliary dental care is increasing in Japan. The Ministry of Health, Labour and Welfare has implemented various

projects aimed at healthcare integration and has revised medical fees in order to promote home dental care. Studies on domiciliary dental care in the elderly have been conducted in Finland<sup>4)</sup>, Scotland<sup>7)</sup> and Belgium<sup>2)</sup>; a number of studies on this issue have also been conducted at universities in the United States<sup>6)</sup>. Dental instruments used in domiciliary care have also been studied<sup>1)</sup>. Domiciliary dental care in an aging society is becoming a common theme in Europe and the United States.

Although many studies have focused on patients receiving home dental care<sup>3)</sup>, few studies have looked at the dental institutions implementing this service. The purpose of this study was to clarify which factors influenced implementation of domiciliary dental care by dental institutions based on a survey of dental institutions in Tokyo conducted by the Tokyo Metropolitan Government and Tokyo Dental Association.

## Materials and Methods

All 8,236 members of the Tokyo Dental Association (as of April, 2011) were surveyed by mail between December 9 and December 26, 2011. The survey items are shown in Table 1. Correlations between each item were determined with the chi-square test based on

responses from proprietors and managers in regards to (1) whether the clinic was within the 23 special wards or other municipalities of Tokyo; (2) age range; (3) whether there were one or more full-time dentists; (4) whether there were zero to one or two or more full-time dental hygienists; (5) whether or not there was cooperation with a primary care physician; (6) whether or not dysphagia rehabilitation was provided; (7) whether or not patients were informed about prevention of aspiration pneumonia; (8) whether or not training on medical and domiciliary dental care for the elderly in need of nursing care was given; and (9) whether or not training workshops and seminars provided by the Tokyo Dental Association in 2010 were attended. The odds ratio and 95% confidence interval were obtained by multiple logistic regression analysis (step-down procedure of stepwise method) in regards to factors that influenced implementation of domiciliary dental care. Next, a similar analysis was conducted in regards to which training program attended significantly influenced domiciliary dental care, that provided by: (1) the Tokyo Metropolitan Center for Oral Health of Persons with Disabilities; (2) the Tokyo Dental Association; (3) local dental associations; (4) university after graduation; and (5) other.

The PASW Statistics 18 (IBM) software package was used for the statistical analysis.

Table 1 Survey items

Age
Proprietor/manager?
Affiliated dental association was within the 23 Special Wards of Tokyo or not.
Number of full-time dentists
Number of full-time dental hygienists
Cooperation with primary care physician?
Provided dysphagia rehabilitation?
Provided information on prevention of aspiration pneumonia?
Attended training on medical or domiciliary dental care for elderly in need of nursing care?
<ul style="list-style-type: none"> <li>• Attended training by Tokyo Metropolitan Center for Oral Health of Persons with Disabilities?</li> <li>• Attended training by Tokyo Dental Association?</li> <li>• Attended training by local dental associations?</li> <li>• Attended training at university after graduation?</li> <li>• Attended other training courses?</li> </ul>
Attended training workshop and seminar by Tokyo Dental Association in 2010?

## Results

Responses were received from 4,031 people, with a response rate of 48.9%. Of the 4,031 people who responded, 86.0% were male and 11.4% female; in terms of age, 34.3% were in their 50s and 21.6% in their 40s, followed by 21.0% in their 60s. Proprietors and managers occupied 79.5% of respondents, managers (on duty) 3.1%, workers 4.4%, and non-responders (unknown) 13.0% (Table 2). The replies from proprietors and managers (2,282) were used for the analysis, except in cases where there was no response.

Correlations between domiciliary dental care and each of the 9 factors are shown in Table 3. People in their 50s or older implemented domiciliary dental care was significantly more often. And in the same way, the

Table 2 Profile of respondents

	n	%
Total	4,031	100.0
Gender		
Male	3,468	86.0
Female	459	11.4
Unknown	104	2.6
Age		
20s	12	0.3
30s	191	4.7
40s	870	21.6
50s	1,384	34.3
60s	847	21.0
Over 70s	627	15.6
Unknown	100	2.5
Proprietor/manager		
Proprietors and managers	3,205	79.5
Managers (on duty)	126	3.1
Workers	177	4.4
Unknown	523	13.0

Table 3 Relationship between each factor and domiciliary dental care

		Implementing domiciliary dental care?				p-value
		Yes		No		
		n	%	n	%	
① Region	The 23 Special Wards of Tokyo	491	28.14	1,254	71.86	0.159
	Other regions (municipalities)	168	31.28	369	68.72	
② Age	20s to 40s	126	23.08	420	76.92	<0.001
	50s and older	533	30.70	1,203	69.30	
③ Number of full-time dentists	1	510	27.81	1,324	72.19	0.022
	2 or more	149	33.26	299	66.74	
④ Two or more dental hygienists	0 or 1	427	27.27	1,139	72.73	0.012
	2 or more	232	32.40	484	67.60	
⑤ Cooperation with primary care physician	Yes	345	36.62	597	63.38	<0.001
	No	314	23.43	1,026	76.57	
⑥ Dysphagia rehabilitation	Yes	244	43.96	311	56.04	<0.001
	No	415	24.03	1,312	75.97	
⑦ Information on prevention of aspiration pneumonia	Yes	504	36.18	889	63.82	<0.001
	No	155	17.44	734	82.56	
⑧ Training on medical, domiciliary dental care for elderly in need of nursing care	Yes	523	42.83	698	57.17	<0.001
	No	136	12.82	925	87.18	
⑨ Attended training workshop and seminar by Tokyo Dental Association in 2010	Yes	311	42.54	420	57.46	<0.001
	No	348	22.44	1,203	77.56	

Chi-square test

proportion of people implementing domiciliary dental care was significantly higher in (1) those working in cooperation with primary care physicians; (2) those who provided dysphagia rehabilitation; (3) those who informed their patients with regard to prevention of aspiration pneumonia; (4) those who attended training on medical and domiciliary dental care for the elderly in need of nursing care; and (5) those who attended training workshops and seminars provided by the Tokyo Dental Association in 2010.

In regards to the results of the logistic regression analysis as indicated in Table 4, a significant odds ratio was obtained for five of six items: (1) cooperation with primary care physicians; (2) provision of dysphagia rehabilitation; (3) informing patients with regard to prevention of aspiration pneumonia; (4) training in medical and domiciliary dental care for the elderly in need of nursing care; and (5) attendance of training workshops and seminars provided by the Tokyo Dental Association in 2010. Attendance at training on medical and domiciliary dental care for the elderly in need of nursing care had the highest odds ratio at 3.78. On the other hand, there were no significant differences between the 23 special wards of urban Tokyo and the other municipalities.

The relationship between implementation of domiciliary dental care and training on medical and domiciliary dental care for the

elderly in need of nursing care is shown in Table 5. Those attending any type of training implemented domiciliary dental care significantly more often. The results of the logistic regression analysis on implementation of domiciliary dental care and attendance of training sessions revealed that those offered by the Tokyo Metropolitan Center for Oral Health of Persons with Disabilities, the Tokyo Dental Association and local dental associations yielded a significant odds ratio (Table 6). Attendance at training provided by the Tokyo Dental Association showed the highest odds ratio at 3.15.

## Discussion

The need for domiciliary dental care has grown with the increase in the number of elderly in Japan, to which the government has responded by implementing a series of measures. Based on a government survey conducted in 2008, however, only 12% and 11% of dental institutions implemented domiciliary care at home and at facilities, respectively, representing just a small percentage<sup>5)</sup>. In the present study, we reviewed factors that influenced implementation of domiciliary dental care by dental institutions in Tokyo. No significant difference was observed between the 23 special wards of urban Tokyo and the other municipalities, indicating a significant

Table 4 Factors that influenced implementation of domiciliary dental care

	Odds ratio	95% confidence interval		Significance
		Lower limit	Upper limit	
Other than the 23 Special Wards of Tokyo	1.24	0.98	1.56	0.067
There was cooperation with primary care physician	1.31	1.07	1.60	0.010
Dysphagia rehabilitation was provided	1.46	1.17	1.84	0.001
Information on prevention of aspiration pneumonia	1.49	1.18	1.88	<0.001
Training on medical, domiciliary dental care for elderly in need of nursing care was attended	3.78	3.02	4.73	<0.001
Training workshop and seminar by Tokyo Dental Association in 2010 was attended	1.53	1.24	1.88	<0.001

Logistic regression analysis (step-down procedure)

Table 5 Relationship between implementation of domiciliary dental care and training on medical, domiciliary dental care for elderly in need of nursing care

Provider of Training		Implementing domiciliary dental care?				p-value
		Yes		No		
		n	%	n	%	
Tokyo Metropolitan Center for Oral Health of Persons with Disabilities	Attended	106	62.72	63	37.28	<0.001
	Did not attend	553	26.17	1,560	73.83	
Tokyo Dental Association	Attended	210	59.15	145	40.85	<0.001
	Did not attend	449	23.30	1,478	76.70	
Local dental associations	Attended	418	44.28	526	55.72	<0.001
	Did not attend	241	18.01	1,097	81.99	
Training by university after graduation	Attended	81	45.00	99	55.00	<0.001
	Did not attend	578	27.50	1,524	72.50	
Other training	Attended	36	46.15	42	53.85	<0.001
	Did not attend	623	28.27	1,581	71.73	

Chi-square test

Table 6 Factors that influenced implementation of domiciliary dental care (training on medical, domiciliary dental care for elderly in need of nursing care)

Explanatory variable	Odds ratio	95% confidence interval		Significance
		Lower limit	Upper limit	
Attended training by Tokyo Metropolitan Center for Oral Health of Persons with Disabilities	2.48	1.73	3.58	<0.001
Attended training by Tokyo Dental Association	3.15	2.44	4.08	<0.001
Attended training by local dental associations	2.96	2.43	3.61	<0.001
Attended other training	2.04	1.23	3.40	0.006

Logistic regression analysis (step-down procedure)

influence of training attended in regards to medical and domiciliary dental care for the elderly in need of nursing care. At the same time, implementation of domiciliary dental care was influenced by (1) whether or not there was cooperation with primary care physicians, (2) whether or not dysphagia rehabilitation was provided, and (3) whether or not information was provided with regard to prevention of aspiration pneumonia. Traditionally, education on domiciliary dental care in the elderly is not provided at the college level. The present results indicate the importance of educating students with regard to the unique challenges such work poses.

Attending seminars hosted by the Tokyo Dental Association also significantly influenced implementation of domiciliary dental care. This seems to be an important result, suggesting the effectiveness of training provided by dental associations with regard to the promotion of domiciliary dental care. This indicates the need for dental associations to provide such training throughout Japan.

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#### *Reprint requests to:*

Dr. SoIchiro Hirata  
 Department of Social Dentistry,  
 Tokyo Dental College,  
 1-2-2 Masago, Mihama-ku,  
 Chiba 261-8502, Japan  
 E-mail: sohirata@tdc.ac.jp