

Characteristics and willingness of patients to pay for regular dental check-ups in Japan

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Abstract: The purpose of this survey was to investigate the relationship between demographic characteristics and willingness of patients to pay for regular dental check-ups in Japan. Questionnaires were distributed at private dental offices and collected via postage-paid return envelopes addressed to the center of the study groups. Questions focused on demographics and willingness to pay for regular check-ups. Five thousand one hundred thirty-two questionnaires were collected (response rate 56.8%). The 3 groups most likely to have regular dental check-ups were found to be the under 20s, 50 to 59 year olds and civil servants. Of these groups, civil servants were found to be the most likely of all to have regular check-ups. More females than males were represented in the sample. More than 60% of the patients responded that they would be willing to pay for regular check-ups if the cost were less than 2,000 yen (about \$ 20). However, no statistically significant differences were observed in relation to household income. The results suggested that participation in regular dental check-ups might be related to gender and age, but not to household income. (J. Oral Sci. 46, 127-133, 2004)

Key words: regular check-ups; willingness to pay; household income.

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Introduction

The decline of the prevalence of dental caries is a worldwide trend (1). This tendency has also been observed in Japan. The national survey for oral diseases, carried out every six years, indicates a tendency toward the decline of dental caries in the deciduous teeth and permanent teeth of the young adult population (2). The services provided by dental professionals have therefore gradually changed from the treatment of dental caries to the provision of regular check-ups and professional preventive programs. However, an increase in periodontal disease has nevertheless been observed (3,4). In Japan, for example, according to a survey in 1999, 72.9% of subjects aged 5 years and older had periodontal disease (2). Prevalence was also found to increase with age, with 88.4% of subjects in the 45- to 54-year-old range having periodontal disease (2). Another survey showed that only 54.4% of patients visit clinics to treat periodontal disease (5). Consequently, there is still a need for regular check-ups and dental care to prevent dental caries (6,7). Furthermore, the need to prevent and treat periodontal disease is high. However, these needs are not always attended to at the dental clinic visited.

The effect of regular check-ups on the prevention of dental caries has not been clearly established. It has been shown that decreasing the frequency of regular check-ups does not lead to an increase in dental caries (8). Another report showed that the incentive of a capitation system reduced dental caries, and the number of deep periodontal and bleeding pockets (9,10). This difference may be derived from the extent of dental care provided at

regular check-ups. In Japan, regular check-ups for post-adolescents are not provided by the public health service. Subjects must therefore obtain these services at private dental clinics, even though Japanese health insurance does not cover the check-ups. The national average percentage of regular check-ups per clinic was less than 5% (7); a figure we consider to be less than satisfactory.

The purpose of this survey was to investigate the relationship between demographic characteristics and willingness of patients to pay for regular dental check-ups in Japan. The goals of our study were to investigate and improve the skills of dentists and dental hygienists working in private dental clinics to better prevent oral diseases and encourage regular check-ups in association with professional preventive programs. In particular, this investigation focused on the factors that discourage persons from attending regular check-ups and strategies to overcome them. We also focused on the difference in characteristics between persons who had regular check-ups and those who did not. In this study, we selected dental clinics that

routinely perform regular check-ups and provide professional preventive programs in Japan.

Materials and Methods

Study population

Thirty-nine private dental clinics in 15 prefectures throughout Japan participated in this study. These private dentists were members of study groups of the Japan Health Care Dental Association. The questionnaires were distributed over a set period of time to all visiting patients in the waiting room of the dental clinics. Patients returned the questionnaires to the study group center using a postage-paid return envelope. A total of 9,024 questionnaires were distributed, of which 5,132 were returned (response rate 56.8 %). The sample population comprised 1,901 men (37.0%), 3,044 women (59.3%) and 187 unknown (3.6%). It should be noted that the samples surveyed in this study comprised of patients visiting dental clinics where regular check-up systems are in place.

Table 1 Questionnaires used in this study

Gender	Age (years)	Occupation	Household income per month (yen)	Regular check-ups experience	Desired cost for regular check-ups (yen)
1 Male	1 - 9	1 Office workers	1 less than 200000	Yes	1 1000
2 Female	2 10 - 14	2 Civil servant	2 200000-300000	No	2 2000
	3 15 - 19	3 Self-employed	3 300000-400000		3 3000
	4 20 - 29	4 Housewife	4 400000-500000		4 4000
	5 30 - 39	5 Student	5 more than 500000		5 5000
	6 40 - 49	6 Part-time job			6 7000
	7 50 - 59	7 No occupation			7 10000
	8 60 - 69	8 Others			8 20000
	9 70 -				

Reasons for visiting clinic	Reason for selecting dental office	Information for selecting dental office
1 Tooth or gum disease	1 Location	1 Specialist
2 Denture problem	2 Personal dental office	2 Technological assessment
3 Health care	3 Technical competence of dentist	3 Cost of treatment
4 Trauma	4 No waiting time	4 Good reputation
5 Others	5 Explanation of treatment	5 Staff
	6 Office open late or on holidays	6 Background of the dentist
	7 Recommendation from associate	7 Others
	8 Recommendation from doctor*	

“Regular check ups” refers to attendance at the dental office for the purpose of the maintaining a healthy oral condition.

* Doctor refers to a medical doctor or another dentist.

Table 2 Demographic characteristics of participants who make regular or infrequent visits for check-ups

(A)

Gender	Regular visitors		Infrequent visitors		No answer		Total	
	n	%	n	%	n	%	n	% (% of Total)
Male	779	41.0	1096	57.7	26	1.4	1901	100 (37.0)
Female	1520	49.9	1475	48.5	49	1.6	3044	100 (59.3)
Unknown	83	44.4	89	47.6	15	8.0	187	100 (3.6)
Total	2382	46.4	2660	51.8	90	1.8	5132	100

(B)

Age (years)	Regular visitors		Infrequent visitors		No answer		Total	
	n	%	n	%	n	%	n	% (% of Total)
- 9	23	69.7	10	30.3	0	0	33	100 (0.6)
10 - 14	142	70.6	56	27.9	3	1.5	201	100 (3.9)
15 - 19	32	31.7	68	67.3	1	1.0	101	100 (2.0)
20 - 29	128	35.2	232	63.7	4	1.1	364	100 (7.1)
30 - 39	331	47.5	364	52.2	2	0.3	697	100 (13.6)
40 - 49	406	51.9	376	48.0	1	0.1	783	100 (15.3)
50 - 59	435	44.7	530	54.5	8	0.8	973	100 (19.0)
60 - 69	385	42.4	492	54.1	32	3.5	909	100 (17.7)
70 -	202	35.6	339	59.7	27	4.8	568	100 (11.1)
No answer	298	59.2	193	38.4	12	2.4	503	100 (9.8)
Total	2382	46.4	2660	51.8	90	1.8	5132	100

(C)

Occupation	Regular visitors		Infrequent visitors		No Answer		Total	
	n	%	n	%	n	%	n	% (% of Total)
Office worker	412	38.6	643	60.3	11	1.0	1066	100 (20.8)
Civil servant	139	55.4	111	44.2	1	0.4	251	100 (4.9)
Self-employed	205	45.3	238	52.5	10	2.2	453	100 (8.8)
Housewife	627	50.2	598	47.9	23	1.8	1248	100 (24.3)
Student	349	60.0	227	39.0	6	1.0	582	100 (11.3)
Part-time job	181	45.4	215	53.9	3	0.8	399	100 (7.8)
Unemployed	241	37.4	388	60.2	15	2.3	644	100 (12.5)
Others	116	46.6	130	52.2	3	1.2	249	100 (4.9)
No answer	112	46.7	110	45.8	18	7.5	240	100 (4.7)
Total	2382	46.4	2660	51.8	90	1.8	5132	100

(A) Gender. (B) Age group. (C) Occupation.

All of these factors were correlated with the likelihood of attending regular check-ups, based on chi-square tests (P values were all less than 0.001). All the chi-square tests excluded “No answer,” “Undetermined,” and “Unknown” categories. “Regular visitors” refers to participants who answered yes to “Regular check-up experience”. “Infrequent visitors” refer to those answering no to “Regular check-up experience”.

Table 3 Reasons for visiting the dental office, reasons for selecting the dental office and information for selecting the dental office

(A)

Reason for visiting clinic	Regular visitors		Infrequent visitors		No answer		Total	
	n	%	n	%	n	%	n	% (% of Total)
Tooth or gum disease	892	34.3	1677	64.4	35	1.3	2604	100 (50.7)
Denture problem	178	28.1	440	69.4	16	2.5	634	100 (12.4)
Health care	1146	78.9	295	20.3	11	0.8	1452	100 (28.3)
Trauma	13	41.9	18	58.1	0	0	31	100 (0.6)
Others	135	37.4	218	60.4	8	2.2	361	100 (7.0)
No answer	18	36.0	12	24.0	20	40.0	50	100 (1.0)
Total	2382	46.4	2660	51.8	90	1.8	5132	100

(B)

Reason for selecting dental office	Regular visits		Infrequent visits		No answer		Total	
	n	%	n	%	n	%	n	% (% of Total)
Location	346	34.6	636	63.5	19	1.9	1001	100 (19.5)
Personal dental office	1150	58.0	806	40.6	27	1.4	1983	100 (38.6)
Technical competence of dentist	296	46.1	335	52.2	11	1.7	642	100 (12.5)
No waiting time	16	40.0	23	57.5	1	2.5	40	100 (0.8)
Explanation of treatment	59	49.6	60	50.4	0	0	119	100 (2.3)
Office open late or on holidays	0	0	4	100.0	0	0	4	100 (0.1)
Recommendation from associate	429	37.3	705	61.4	15	1.3	1149	100 (22.4)
Recommendation from doctor*	53	55.2	43	44.8	0	0	96	100 (1.9)
No answer	33	33.7	48	49.0	17	17.3	98	100 (1.9)
Total	2382	46.4	2660	51.8	90	1.8	5132	100

(C)

Information for selecting dental office	Regular visitors		Infrequent visitors		No answer		Total	
	n	%	n	%	n	%	n	% (% of Total)
Specialist	728	48.9	741	49.8	20	1.3	1489	100 (29.0)
Technological assessment	526	46.1	600	52.5	16	1.4	1142	100 (22.3)
Cost of treatment	112	38.2	177	60.4	4	1.4	293	100 (5.7)
Good reputation	805	45.9	932	53.1	17	1.0	1754	100 (34.2)
Staff	69	46.3	77	51.7	3	2.0	149	100 (2.9)
Background of the dentist	25	46.3	29	53.7	0	0	54	100 (1.1)
Others	52	55.3	40	42.6	2	2.1	94	100 (1.8)
No answer	65	41.4	64	40.8	28	17.8	157	100 (3.1)
Total	2382	46.4	2660	51.8	90	1.8	5132	100

(A) A high proportion of regular visitors visited dental offices for health care.

(B) 63.5% of infrequent visitors selected the dental office by location. There was little difference observed in the influence of the factors of technique, waiting time and explanation. * Doctor refers to a medical doctor or another dentist.

(C) There was little difference between regular and infrequent visitors with regard to the information used for dental office selection.

Questionnaires

The questionnaires consisted of items relating to demographics, regular check-up experience, desired cost of regular check-ups, reason(s) for visiting the dental clinics, the main reasons for dental clinic selection, information used for dental clinic selection, and monthly household incomes. All questionnaires were presented in a forced-choice format. (Table 1). In the case of patients aged 12 years and below the questionnaires were completed by family members.

Statistical analysis

To investigate the differences between those who visited clinics regularly (Regular check-up experience, Yes) and those who did not (Regular check-up experience, No), chi-square tests for the nominal scales and two-way ANOVA for ordinal scales were used. In addition, multiple logistic regression analysis was used to calculate the odds ratios for regular visitors to control for confounders. These

analyses were performed using SPSS ver. 11.0 (SPSS, Tokyo, Japan).

Results

The number of patients who reported visiting clinics regularly (Regular check-up experience, Yes) was 2,382 (46.4%), and their demographic characteristics are shown in Table 2. There were more female regular visitors (49.9%) than male visitors (41.0%) (Table 2A). When comparing by age group, many of the regular visitors were found to be aged under 14 years. In contrast, a high proportion of the 15- to 29-year-old group did not visit regularly. From age 15 to 49, the proportion of infrequent visitors (Regular check-up experience, No) decreased, then from age 50 and above, it increased. (Table 2B) When comparing by occupational group, the proportion of infrequent visitors was especially high in office workers (Table 2C).

The three major reasons for attending dental clinics were tooth or gum disease, routine health care, and denture

Table 4 Willingness of regular and infrequent visitors to pay for regular check-ups

(A)

Desired cost for regular check-ups (yen)	Regular visitors		Infrequent visitors		No answer		Total	
	n	%	n	%	n	%	n	%
1000	673	29.4	930	36.4	18	37.5	1621	31.6
2000	923	40.3	1022	40.0	17	35.4	1962	38.2
3000	501	21.9	439	17.2	9	18.8	949	18.5
4000	27	1.2	14	0.5	0	0.0	41	0.8
5000	133	5.8	106	4.1	2	4.2	241	4.7
7000	7	0.3	6	0.2	0	0.0	13	0.3
10000	17	0.7	25	1.0	1	2.1	43	0.8
20000	7	0.3	13	0.5	1	2.1	21	0.4
No answer	95	4.2	104	4.1	42	37.5	241	4.7
Total	2288	100	2555	100	48	100	5132	100

(B)

Desired cost of treatment	less than 1,000		less than 2,000		more than 2,000		No answer		Total	
	n	%	n	%	n	%	n	%	n	%
Household income										
less than 200,000	181	11.2	139	7.1	55	4.2	116	48.1	491	9.6
200,000 - 300,000	353	41.5	339	17.3	148	17.4	11	1.3	851	16.6
300,000 - 400,000	355	21.9	459	23.4	277	21.2	26	10.8	1117	21.8
400,000 - 500,000	206	12.7	287	14.6	184	14.1	31	12.9	708	13.8
more than 500,000	280	17.3	459	23.4	444	33.9	37	15.4	1220	23.8
No answer	246	15.2	279	14.2	200	15.3	120	49.8	845	16.5
Total	1621	100	1962	100	1308	100	241	100.0	5132	100

(A) Willingness of regular and infrequent visitors to pay for regular check-ups. More than 60% of patients were willing to pay for regular check-ups if the cost were less than 2,000 yen. There was little difference between regular and infrequent visitors.

(B) Willingness to pay and household income per month. There were no clear differences in the willingness to pay based on household income.

Table 5 Ratios for regular check-up visits

	Odds Ratio	95% CI	P-value
Gender			
Male	0.65	0.77 - 0.55	< 0.01
Age group			
-9	5.22	1.91 - 14.27	< 0.01
10-19	7.39	3.11 - 17.53	< 0.01
20-29	1.22	0.48 - 3.10	0.68
30-39	1.01	0.70 - 1.46	0.95
40-49	1.31	0.97 - 1.77	0.08
50-59	1.59	1.18 - 2.13	0.00
60-69	1.31	0.99 - 1.74	0.06
70-	1.38	1.05 - 1.80	0.02
Occupation			
Office worker	0.97	0.67 - 1.41	0.89
Civil servant	1.74	1.12 - 2.70	0.01
Self-employed	1.24	0.83 - 1.85	0.29
Housewife	1.30	0.90 - 1.88	0.17
Student	0.66	0.29 - 1.51	0.33
Part-time job	1.02	0.68 - 1.54	0.91
Unemployed	1.02	0.68 - 1.53	0.94
Household income			
less than 200,000	0.91	0.68 - 1.23	0.55
200,000 - 300,000	1.14	0.69 - 1.91	0.61
300,000 - 400,000	1.15	0.66 - 1.99	0.62
400,000 - 500,000	1.14	0.65 - 1.99	0.64
more than 500,000	1.36	0.79 - 2.36	0.27

We included all the demographic factors for logistic regression analysis of regular check-up visits.

The results indicated that men were inclined not to be regular visitors.

Persons aged under 20, persons aged 50 to 59, and civil servants were inclined to be regular visitors.

However, no statistically significant differences were observed with regard to household income.

problems in this study. The proportion of infrequent visitors was high for tooth or gum disease, and was higher than regular visitors for denture problems (Table 3A).

The major reasons for dental clinic selection were personal dental office (1,983; 38.6%), recommendation from an associate (1,149; 22.4%), and location (1,001; 19.5%). Infrequent visitors were more likely than regular visitors to include recommendations from an associate and location as reasons for dental clinic selection (Table 3B).

Information used for selecting a dental clinic included good reputation, specialist, and technological assessment. There was considerable variation for both regular and infrequent visitors with respect to the information used for dental clinic selection (Table 3C).

As shown in Table 3A, most visitors were willing to pay less than 2,000 yen (about \$ 20). The proportion of regular visitors was not large in any of the groups. The difference

was statistically significant based on two-way ANOVA. Table 4B compares the willingness of using household income to pay. As household income increased, the number of persons willing to pay less than 1,000 yen (about \$ 10) decreased. In contrast, the number of persons willing to pay less than 2,000 yen (about \$ 20) and the number of persons willing to pay more than 2,000 yen increased.

To control for confounders, we used all the demographic factors to calculate the odds ratio of the persons who visited regularly for check-ups. As shown in Table 5, men tended not to visit clinics regularly. Relatively more persons under 20 years old, 50- to 59-year-olds and civil servants visited clinics regularly. No statistically significant difference was observed in relation to household income. When comparing by occupation, the relatively high proportion of students who visit clinics regularly was found to be not statistically significant.

Discussion

The present survey demonstrated two important issues that should be improved in order to promote the willingness of patients to pay for regular dental check-ups in Japan. First, the environmental considerations for adult working males should be improved. According to our survey, the majority of those not receiving regular check-ups were male (Table 2A). The age group of 50 - 59 years comprised of more persons who did not visit clinics regularly than those who did. Logistic regression analysis revealed statistically significant differences for males. In the age groups for 20 to 49, there were no regular visitors and occupation was not always associated with regular attendance. However, as the prevalence of periodontal disease is high in this population (1), regular check-ups should be encouraged so as to minimize the prevalence of periodontal disease. One of the most important reasons deterring adult males from regular check-ups was the high opportunity cost. The survey of factors influencing regular check-ups revealed that the main criteria for selecting clinics included, location, appointment times for visits to the clinics, and whether the clinic held late hours. To meet these demands, clinics should be open for late hours and on weekends.

A method of payment for regular check-ups is also necessary. In this survey, 73.3% of the patients answered that they were willing to pay less than 2,000 yen (about \$ 20) for regular check-ups. The national average hourly fee for a dental hygienist in Japan is 1,938 yen (about \$ 19)(13). At this hourly rate, the treatment in professional preventive programs should be completed over 20 or 30 minutes. These facts indicate that professional preventive programs costing less 2,000 yen might have not profits in dental clinics, because the current insurance system in Japan does not provide for dental health maintenance. The system improved slightly in 2002, to cover regular check-ups, but only for patients with periodontal disease after treatment. This change may well promote regular check-ups.

In conclusion, the present survey indicates that the likelihood of attending regular dental check-ups is related to gender and age, but not to household income.

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References

1. Sheiham A (1984) Changing trends in dental caries. *Int J Epidemiol* 13, 142-147
2. Health Policy Bureau Ministry Health and Welfare, Japan (2001) Report on the survey of dental disease 1999. Oral Health Association, Tokyo, 1-178 (in Japanese)
3. Borrell LN, Burt BA, Gillespie BW, Lynch J, Neighbors H (2002) Periodontitis in the United States: beyond black and white. *J Public Health Dent* 62, 92-101
4. Griffiths GS, Duffy S, Eaton KA, Gilthorpe MS, Johnson NW (2001) Prevalence and extent of lifetime cumulative attachment loss (LCAL) at different thresholds and associations with clinical variables: changes in a population of young male military recruits over 3 years. *J Clin Periodontol* 28, 961-969
5. Policy document: the dental needs of children 1990. *Br Dent J* 168, 79-81
6. Crossner CG, Unell L (1986) A longitudinal study of dental health and treatment need in Swedish teenagers. *Community Dent Oral Epidemiol* 14, 10-14
7. Statistics and Information Department, Minister's Secretariat, Ministry of Health, Labour and Welfare Japan (1998) Comprehensive Survey of Living Condition of the People on Health and Welfare. Health and Welfare Statistics Association, Tokyo (in Japanese)
8. Karkkainen S, Seppa L, Hausen H (2001) Dental check-up intervals and caries preventive measures received by adolescents in Finland. *Community Dent Health* 18, 157-161
9. Holloway PJ, Clarkson JE (1994) Cost benefit of prevention in practice. *Inter Dent J* 44, 317-322
10. Mellor AC, Blinkhorn AS, Hassall DC, Holloway PJ, Worthington HV (2000) An assessment of capitation in the General Dental Service Contact 2. Patterns of treatment provided to regularly attending patients. *Br Dent J* 182, 460-464
11. Okada M, Kuwahara S, Kaihara Y, Ishidori H, Kawamura M, Miura K, Nagasaka N (2000) Relationship between gingival health and dental caries in children aged 7-12 years. *J Oral Sci* 42, 151-155
12. Zickert I (2000) Disease activity and need for dental care in a capitation plan based on risk assessment. *Br Dent J* 189, 480-486
13. Statistics and Information Department, Minister's Secretariat, Ministry of Health, Labour and Welfare Japan (2002) Basic Survey on Wage Structure 2000. Rodohorei Kyokai, Tokyo, 64-65 (in Japanese)

1. Sheiham A (1984) Changing trends in dental caries.