

## Scientific Research Report

## Job Satisfaction and Perceived Importance of Oral Medicine Amongst Dentists



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## ABSTRACT

**Background:** Compounded by the needs of an aging society, interactions between oral condition and systemic diseases may require that dentists pursue additional training in oral medicine beyond that received in dental school. The purpose of this study was to investigate whether pursuing oral medicine professional education is recognised by dental practitioners as an important factor regarding job satisfaction.

**Methods:** A questionnaire was mailed to 1,379 dental practitioners in Japan, along with a follow-up survey to assess repeatability, in 2017. The questionnaire consisted of 19 items/questions related to the respondents' attributes and job satisfaction (5 items), willingness to learn oral medicine (4 items), willingness to learn more about dentistry (4 items), and willingness to contribute to society (6 items). Representative questions were extracted via binomial logistic regression analysis. Multivariable logistic regression analysis was performed to assess the relationships between job satisfaction and the explanatory variables.

**Results:** Amongst 337 respondents, multivariable logistic regression analysis showed an association between strong job satisfaction ( $n = 126$ , 37%) and willingness to learn more about oral medicine and dentistry and contribute to society, with odds ratios (95% confidence interval) of 4.22 (1.84-9.68), 3.16 (1.16-8.62), and 7.32 (3.14-17.06) and  $\kappa$  values of 0.38, 0.58, and 0.51, respectively.

**Conclusions:** Our results from dental practitioners suggest additional benefits of oral medicine professional education for future job satisfaction.

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## INTRODUCTION

Recently, dentistry has entered a new era in which the needs of a globally aging society must be addressed.<sup>1</sup> The relationship between periodontal disease and systemic disease has been clearly demonstrated,<sup>2</sup> since the link between oral diseases and noncommunicable diseases was first proposed in 2000, with risk factors common to both types of diseases.<sup>3</sup> Japan has one of the fastest-aging populations in the world.<sup>4</sup> Dental treatment of aged populations requires a background knowledge of systemic diseases.<sup>5</sup> In particular, in Japan,

maintenance of oral function including perioperative oral hygiene management,<sup>6</sup> continuous oral care for elderly patients,<sup>7</sup> and swallowing training<sup>8</sup> are regarded as important because improvement of oral function in elderly people helps prevent the need for long-term care. In fact, dentists in Japan receive reimbursements for these dental procedures in the universal health insurance system. The importance of "oral medicine," that is, the medical knowledge and practice needed to understand the interaction between medical and oral health and provide safe dental care to patients, is increasingly recognised in many parts of the world.<sup>9</sup> In a few countries, oral medicine already has been the branch and specialty of dentistry concerned with patients with primarily nonsurgical management and/or medically complex patients. On the other hand, oral medicine has not been positioned as a specialised sector in dental schools in Japan (21%). In addition, no adequate fact-finding survey on "oral medicine"

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education at each dental school and dentistry department has been conducted<sup>5</sup>

The job satisfaction of dentists is directly associated with their recruitment and retention<sup>10,11</sup> as well as improvement in general dental practice.<sup>12</sup> To this end, a variety of factors, including relationships with colleagues, patients, and staff as well as personal time, intrinsic satisfaction, community and administrative responsibilities, and available resources, have been explored as factors that could potentially contribute to the job satisfaction of dentists.<sup>13</sup> However, “oral medicine,” specifically, access to the most up-to-date information or continuing education in this area, has not been considered as a factor in earlier studies. The results from the abovementioned survey<sup>13</sup> imply that job autonomy, competitive pay, flexible working hours, and minimal administrative burden would improve the job satisfaction of dentists.

The perceived importance of oral medicine and access to professional courses in this field may provide some incentive for dentists to pursue additional educational opportunities in an effort to improve their dental practice. We hypothesize that, in doing so, they will also improve their future job satisfaction. Thus, the purpose of this study was to investigate whether oral medicine is recognised by dental practitioners as important for their professional education from the aspect of job satisfaction.

## METHODS

We identified and extracted data from 1,379 dental clinics using an available domestic database derived from the Japanese telephone directory (NTT, NTT Town Page Corp.). The numbers of dental clinics were weighted by region, with clinics representing a specified district in Tokyo metropolis, a government ordinance–designated city, a designated mid-level city, and another municipality (Table 1). The total number of dental clinics selected was equivalent to 2% of all dental clinics in Japan (68,943 clinics) as of September 2016.<sup>14</sup> A questionnaire was mailed to the dental practitioners in 2017. The same questionnaire was sent again to early respondents who returned the questionnaire within 10 days after the questionnaire was sent, in an attempt to measure the repeatability of the original questionnaire survey. The present study was approved by the Institutional Ethics Review Board of Fukuoka Gakuen (#330).

The questionnaire consisted of 19 items related to the respondents' attributes (4 items), job satisfaction (1 item), and the perceived importance of oral medicine through their willingness to learn oral medicine (4 items), willingness to learn more about dentistry (4 items), and willingness to contribute to society (6 items), as shown in Table 1. Answers were scored using a 5-point Likert scale as follows: 1, strongly disagree; 2, disagree; 3, neither agree or disagree; 4, agree; and 5, strongly agree.<sup>15</sup> Several questions/items about their willingness to learn more about dentistry were derived from previous studies<sup>16,17</sup>; the others were developed by the authors, with modifications based on the opinions of 12 dental practitioners in a pilot survey.

The answers related to job satisfaction were transformed into binary data, with “strong job satisfaction”

corresponding to the highest score category and “other” for everything else. The answers related to the perceived importance of oral medicine were transformed into binary or tertiary data, depending on the number of responses for each Likert scale score.

Amongst the questions on respondents' willingness to learn more about oral medicine or dentistry and contribute to society, a representative question was selected for each variable for further analyses to clarify the association with job satisfaction. The question chosen was most closely related to “strong job satisfaction” based on the odds ratio (OR) associated with the highest score for the perceived importance of oral medicine, with the lowest score used as a reference. Multivariable logistic regression analysis was performed with “strong job satisfaction” as the objective variable and a total of 7 survey topics, including the perceived importance of oral medicine and four other attributes, as explanatory variables. Statistical software (JMP™ 13.0.0; SAS Institute Japan Ltd.) was used for analysis. Statistical significance was set at  $P < .05$ . The repeatability of answers was assessed according to the agreement measures for categorical data as follows (kappa [ $\kappa$ ] statistic, strength of agreement):  $< 0.00$ , poor;  $0.00-0.20$ , slight;  $0.21-0.40$ , fair;  $0.41-0.60$ , moderate;  $0.61-0.80$ , substantial; and  $0.81-1.00$ , almost perfect.<sup>18</sup>

## RESULTS

Of the 1,379 people surveyed, 337 dentists responded to the questionnaire, giving a response rate of 24%. Table 2 summarises the attributes of the respondents, including the sex and age of the respondents, the location classification of the dental clinics, the number of patients treated by respondents per day, and perceived job satisfaction. Most (92%) of the respondents were male, and 59% were aged 55 years or older. Half of the respondents treated more than 20 patients a day. Approximately one-third of the respondents (37%) agreed strongly with the opinion “Overall, I'm satisfied with being a dentist.”

Table 3 shows the association between strong job satisfaction and willingness to learn oral medicine. The ORs for the 3 questions, “I think I have the minimum medical knowledge required as a dentist,” “I am investigating things that I do not understand in the medical field,” and “Dentists should acquire medical knowledge,” were 5.23, 2.32, and 1.92, respectively, and the relationship with strong job satisfaction was statistically significant. The item “I think I have the minimum medical knowledge required as a dentist,” which was associated with the highest OR, was selected to represent the willingness to learn oral medicine. Appendix Tables 1 and 2 show the relationships of strong job satisfaction with the willingness to learn more about dentistry and the willingness to contribute to society. All questions were significantly associated with strong job satisfaction. The items with the highest ORs for willingness to learn more about dentistry and contribute to society were “I am studying to improve clinical skills” and “Dental care is the area in which I can make the most significant contribution to society,” with ORs of 7.05 and 8.03, respectively.

**Table 1 – Questions and response options in the questionnaire.**

Questions	Response options				
Attributes					
Sex	Male	Female			
Age (y)	≤34	35-44	45-54	55-64	≥65
Location of dental clinic	A district in Tokyo metropolis	A government ordinance–designated city	A designated mid-level city	Another municipality	
Average number of patients I see in a day	≤9	10-14	15-19	20-24	≥25
Job satisfaction					
Overall, I am satisfied with being a dentist.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Willingness to learn oral medicine					
I think I have the minimum medical knowledge required as a dentist.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am investigating things that I do not understand in the medical field.					
Dentists should acquire medical knowledge.					
How many of the following medical subjects would you like to study as a dental student? Ophthalmology, emergency medicine, surgery, obstetrics/gynaecology, otolaryngology, paediatrics, orthopaedics, psychiatry, internal medicine, urology, dermatology, radiation science, anaesthesiology, other ().	0-2	3-5	6-14		
Willingness to learn more about dentistry					
I am satisfied with my clinical technique.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I think I should study continuously while working as a dentist.					
I am studying to improve my clinical skills.					
I think I study a lot as a dentist.					
Willingness to contribute to society					
I think that society has high expectations of dentists.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
As a dentist, I do a lot for society.					
I work for my family and myself rather than for society.					
I want to help society as a dentist.					
I do not think I am working for society.					
Dental practice is an area in which I can make a big contribution to society.					

Table 4 shows the association between strong job satisfaction and the perceived importance of oral medicine in the questionnaire. Multivariable logistic regression analysis showed that the highest score for willingness to learn oral medicine was significantly associated with strong job satisfaction, with an adjusted OR (95% confidence interval) of 4.22 (1.84-9.68) ( $P < .001$ ). The highest scores for willingness to learn more about dentistry and contribute to society were also associated significantly with strong job satisfaction, with adjusted ORs of 3.16 (1.16-8.62) ( $P = .025$ ) and 7.32 (3.14-17.06) ( $P < .001$ ), respectively. In addition, we performed multivariable logistic regression analysis

using each question as it related to the willingness to learn oral medicine as a representative question (data not shown). The results showed that only the item with the highest OR, “I think I have the minimum medical knowledge required as a dentist,” was significantly related to job satisfaction.

In the follow-up survey, 91 of 106 dentists responded (86%). The strength of agreement ( $\kappa$  statistic) in the repeatability test for the representative variables indicating the perceived importance of oral medicine was as follows: fair (0.38) for the willingness to learn oral medicine, moderate (0.58) for the willingness to learn more about dentistry, and moderate

**Table 2 – Demographic characteristics of the respondents.**

	Respondents		National average
	No.	%	%
Sex			
Male	310	92	91
Female	25	7	9
Unknown	2	1	–
Age (y)			
≤34	6	2	1
35-44	45	13	14
45-54	87	26	28
55-64	141	42	35
≥65	57	17	22
Unknown	1	0	–
Location of dental clinic			
A district in Tokyo metropolis	28	8	12
A government ordinance –designated city	72	21	24
A designated mid-level city	54	16	15
Another municipality	180	53	49
Unknown	3	1	–
Number of patients treated by respondents per day			
≤9	31	9	
10-14	57	17	
15-19	68	20	
20-24	59	18	
≥25	120	36	
Unknown	2	1	
Overall, I am satisfied with being a dentist.			
Strongly agree	126	37	
Agree	157	47	
Neither agree nor disagree	39	12	
Disagree	13	4	
Strongly disagree	2	1	
Unknown	0	0	

(0.51) for the willingness to contribute to society (data not shown).

**DISCUSSION**

“Willingness to learn oral medicine” was used as an independent variable in a multivariable analysis to explain “strong job satisfaction” in dental practitioners. The perceived importance of oral medicine was assessed with its potential confounders based on the following: a willingness to learn oral medicine, a willingness to learn more about dentistry, and a willingness to contribute to society. As expected, strong job satisfaction was significantly associated with willingness to learn more about dentistry and contribute to society. Willingness to learn oral medicine was independently associated with strong job satisfaction. Surprisingly, the OR was higher for willingness to learn oral medicine than for willingness to learn more about dentistry (4.22 vs 3.16), after adjustment for potential confounders. The relationship between willingness to learn oral medicine and strong job satisfaction was

**Table 3 – Association between strong job satisfaction and willingness to learn oral medicine.**

Question	%	OR	95%CI	P value
I think I have the minimum medical knowledge required as a dentist.				
Neither agree nor disagree/Disagree/Strongly disagree	25	1	1.38-4.85	.003
Agree	49	2.58	2.63-10.42	<.001
Strongly agree	26	5.23		
I am investigating things that I do not understand in the medical field.				
Neither agree nor disagree/Disagree/Strongly disagree	10	1	0.53-2.80	.652
Agree	47	1.21	1.01-5.34	.048
Strongly agree	43	2.32		
Dentists should acquire medical knowledge.				
Agree/Neither agree nor disagree/Disagree/Strongly disagree	35	1	1.18-3.11	.008
Strongly agree	65	1.92		
How many of the following medical subjects would you like to study as a dental student? Ophthalmology, emergency medicine, surgery, obstetrics/gynaecology, otolaryngology, paediatrics, orthopaedics, psychiatry, internal medicine, urology, dermatology, radiation science, anaesthesiology, other ().				
0-2	25	1	0.52-1.56	.707
3-5	50	0.9	0.88-3.04	.119
6-14	25	1.64		

independent of the dentist's sex, age, clinic location, or number of patients (which is related to income).

Prior to the initial survey, we modified and chose the questions to be used in the survey and confirmed that the 3 questions provided information on the willingness to learn oral medicine by having 12 peer dentists test the questionnaire. The question “I think I have the minimum medical knowledge required as a dentist” may be vague with respect to direction, but its validity could be confirmed based on the survey results. The numbers of answers to the items “I have medical knowledge and dentists do not have to study” and “I have no medical knowledge and dentists should study” were 2 and 17, respectively, representing only 6% of the responders. Similarly, when compared with the responses to “I am investigating things that I do not understand in the medical field,” the numbers of answers for “I have medical knowledge and I am not investigating” and “I have no medical knowledge and I am investigating” were 0 and 12, respectively, representing only 4% of the responders.

It is reasonable that “knowledge” is a preceding factor, as it is the foundation of the knowledge, attitude, and practices (KAP) model.<sup>19</sup> The items/questions about the willingness to learn oral medicine (“I'm investigating anything that I don't understand in the medical field,” “Dentists should acquire

**Table 4 – Associations between strong job satisfaction and willingness to learn oral medicine, willingness to learn more about dentistry, willingness to contribute to society, and 4 other factors.**

Variables and categories	No.	%	Prevalence of strong job satisfaction	Crude			Adjusted <sup>a</sup>		
				OR	(95% CI)	P	OR	(95% CI)	P
Sex									
Female	25	7	24	1			1		
Male	310	92	38	1.97	(0.77-5.08)	.159	2.07	(0.69-6.24)	.194
Age (y)									
≥65	57	17	40	1			1		
55-64	141	42	34	0.76	(0.40-1.44)	.403	0.77	(0.35-1.69)	.509
45-54	87	26	37	0.86	(0.43-1.71)	.667	0.84	(0.36-1.98)	.694
≤44	51	15	43	1.12	(0.52-2.41)	.769	1.50	(0.58-3.83)	.401
Location of dental clinic									
A district in Tokyo metropolis	28	8	25	1			1		
A government ordinance–designated city	72	21	40	2.02	(0.76-5.37)	.157	1.20	(0.37-3.87)	.760
A designated mid-level city	54	16	31	1.38	(0.49-3.86)	.542	0.78	(0.23-2.69)	.229
Another municipality	180	53	39	1.95	(0.79-4.84)	.147	1.24	(0.42-3.66)	.419
Average number of patients I see in a day									
≤9	31	9	39	1			1		
10-14	57	17	25	0.52	(0.20-1.32)	.168	0.41	(0.13-1.30)	.129
15-19	68	20	38	0.98	(0.41-2.35)	.964	0.67	(0.22-2.01)	.477
20-24	59	18	36	0.88	(0.36-2.15)	.771	0.53	(0.17-1.63)	.267
≥25	120	36	43	1.21	(0.54-2.72)	.643	0.57	(0.20-1.61)	.287
Willingness to learn oral medicine									
I think I have the minimum medical knowledge required as a dentist.									
Neither agree nor disagree/Disagree/Strongly disagree	84	25	19	1			1		
Agree	164	49	38	2.58	(1.38-4.85)	.003	2.12	(1.02-4.40)	.045
Strongly agree	87	26	55	5.23	(2.63-10.42)	<.001	4.22	(1.84-9.68)	<.001
Willingness to learn more about dentistry									
I am studying to improve my clinical skills.									
Neither agree nor disagree/Disagree/Strongly disagree	52	15	13	1			1		
Agree	155	46	33	3.15	(1.33-7.48)	.009	2.29	(0.86-6.11)	.097
Strongly agree	130	39	52	7.05	(2.96-16.79)	<.001	3.16	(1.16-8.62)	.025
Willingness to contribute to society									
Dental practice is an area in which I can make a big contribution to society.									
Neither agree nor disagree/Disagree/Strongly disagree	59	18	15	1			1		
Agree	118	35	19	1.35	(0.58-3.13)	.491	1.15	(0.47-2.84)	.756
Strongly agree	159	47	59	8.03	(3.69-17.47)	<.001	7.32	(3.14-17.06)	<.001

OR, odds ratio; 95% CI, 95% confidence interval.

<sup>a</sup> Adjusted for all variables listed in the table.

medical knowledge,” and “How many of the following medical subjects would you like to study as a dental student?”) could be interpreted as variables indicative of the behaviour, motivation, and experience related to learning oral medicine, respectively; however, the ORs for these 3 items/questions were lower than that for “having medical knowledge” (Table 3). Of the 4 questions, the item “Dentists should acquire medical knowledge” is a general question, whereas the other 3 are personal questions. This difference may explain why the general question had a weak relationship with job satisfaction. Also, “medical knowledge” may be perceived as broad medical knowledge, whereas “the minimum medical knowledge” may be regarded as

medical knowledge related to dentistry. Dentists with high job satisfaction may have emphasised medical knowledge related to dentistry rather than broad medical knowledge because of their pride in being a dentist.

Willingness to learn oral medicine can be classified into intrinsic factors that have a positive impact on job satisfaction and extrinsic secondary factors that may or may not work to this end. The 2-factor theory of job satisfaction that poses intrinsic and extrinsic components as factors associated has been applied to dental professionals.<sup>10</sup> Motivating factors, for example, the opportunity to learn and apply new knowledge, such as that in the case of oral

medicine, would be an example of intrinsic factors for dentists and could potentially result in better job satisfaction.<sup>10</sup> Willingness to learn oral medicine, therefore, may facilitate the pursuit of activities that improve the working conditions of dentists and ensure quality of care. On the other hand, factors such as the number of patients treated per day were considered extrinsic factors and were not significantly associated with strong job satisfaction. This finding is in agreement with the results of a previous study<sup>20</sup> in which “willingness to learn oral medicine” was a factor that weakened the perception of dentist oversupply. In other words, those who were highly motivated to learn oral medicine also had high job satisfaction, suggesting that they may have personality characteristics that render them unafraid of negative information such as that related to an oversupply of dentists.

Oral medicine education should be promoted as part of dental training; however, several barriers are anticipated, such as securing educational time and improving the qualifications of teachers. Given the demands of an aging society, inter-professional education (IPE) has been promoted in dentistry curricula for a student to recognise roles of specialists and their collaboration in order to achieve inter-professional works in the community-based comprehensive care system after graduation. IPE integration of oral medicine could address this issue.<sup>21</sup>

This study had a few limitations. First, the response rate of the present survey was low. We performed a repeatability test to validate the accuracy of the responses. Amongst 3 variables related to the perceived importance of oral medicine, the lowest repeatability score obtained still suggested fair agreement. In this study, 84% of the dentists were satisfied with being a dentist, which is comparable to the findings that 87%<sup>13</sup> and 76%<sup>22</sup> answered that they were “strongly satisfied” or “satisfied” with being a dentist in previous surveys. Additionally, the sample population in the present study may be representative of Japanese dentists; distributions of sex, age, and clinic location classification were close to the national distributions,<sup>23</sup> as shown in Table 2. Therefore, potential discrepancies were likely compensated for to some extent by the sampling method. However, the results should be carefully interpreted for selection bias, although multivariable analysis should have minimised confounding bias. The second limitation was the cross-sectional design of the study, which limits the ability to evaluate causal associations. An intervention study is needed to clarify whether educating dental students about oral medicine increases job satisfaction after graduation. The dose–response relationship between willingness to learn oral medicine and strong job satisfaction could contribute to potential causal associations.

## CONCLUSIONS

An independent relationship was established between willingness to learn oral medicine and “strong job satisfaction.” Within the limitations of our survey, we conclude that dental practitioners recognise that there are additional benefits in pursuing oral medicine professional education in terms of their future job satisfaction.

## Conflict of interest

None disclosed.

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## Supplementary materials

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