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Original Article

Treatment Capabilities of Postgraduate Dental Trainees at Tokyo Dental College Suidobashi Hospital Based on Dental Services Income

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Abstract

As of fiscal year 2006, it became compulsory for all newly licensed dentists in Japan to undergo a year of practical training at one of the designated training facilities found throughout the country as part of their postgraduate programs. The goal of this training is for the trainees to acquire diagnostic and therapeutic skills. While officially trainees, they are nonetheless regarded as members of staff. Clinical training emphasizes improving both technical skills and theoretical knowledge. However, taking on such trainees is sometimes considered unprofitable, as work productivity is claimed to be low. The purpose of this study was to compare work outcomes and income generated between trainees and part-time dentists working at the Tokyo Dental College Suidobashi Hospital. The part-time dentists comprised clinical instructors and dentists responsible for outpatients. Postgraduate dental trainees also generally conduct dental treatment for outpatients. Therefore, part-time dentists were considered the most suitable for a control group. No significant difference was observed in the total number of patients seen by either group by the final term of clinical training. Furthermore, no significant difference was observed in insurance-based dental treatment unit income (insured care unit income) per patient between the two groups from the mid-term period of training onwards. These results suggest that, although the trainees were less efficient in terms of time taken to provide a diagnosis and treatment, their performance was almost equal when viewed from the viewpoint of insured care provided. Taken together, this suggests that time-related care efficiency must be increased and specific training policies and strategies developed to improve the work productivity of dental trainees.

Key words: Postgraduate dental trainees — Dental services income — Insured care unit income per patient

Introduction

As of fiscal year (FY) 2006, practical training became a compulsory component of postgraduate dental clinical training programs in Japan. From then on, all newly licensed dentists would be required to undergo dental clinical training for a minimum of 1 year at a designated clinical training facility³⁻⁵⁾.

Prior to this, however, a newly licensed dentist could go straight into private practice. Moreover, there were no regulations concerning what kind of postgraduate training they were to receive before doing so. Therefore, there were, in effect, no guarantees as to their level of clinical ability. Freshly qualified dentists who chose to remain at their university hospitals were either unpaid or received only low wages. The main purpose, therefore, of the new compulsory training program was to guarantee uniformity of content and improve the working status of the dental trainee.

The trainee could choose whether to pursue the program at a university hospital or a clinical training facility designated by the Japanese Ministry of Health, Labour and Welfare. The content of the program itself, along with clear goals to be attained, was set with the aim of ensuring that the student would have reached a specific level of ability on completing the course¹⁰⁾. Furthermore, the trainees were to be henceforth considered as employed members of staff, thus effecting improvements in their working status and income.

Since its inception, however, a number of problems have arisen with regard to this program. From a training perspective, the priority has been to improve the trainee's level of technical skill and theoretical knowledge. Moreover, it takes longer for a trainee to provide a diagnosis and treat a patient. The result has been a perceived deficit in productivity when employing trainees. In other words, the number of dental care units (completion of treatment in one patient) is lower with trainees, which adversely affects income. Finally, ensuring that the care provided by such trainees is safe and appropriate also

reduces efficiency.

As a result of all this, productivity suffers when employing trainees, making them an unprofitable proposition^{9,13,15)}. Even though such training may be subsidized, the employer is still largely responsible for remunerating them from the income of their own business, which can be a serious burden. Yet, few studies have addressed the question of whether such trainees are fully competent to provide treatment^{1,2,14,16)}.

At our hospital, while the postgraduate dental trainees are responsible for the more basic procedures, the full-time staff take care of the more specialized work. Most part-time dentists, on the other hand, perform general dental care at a private dental practice. This suggests that part-time dentists would be a more appropriate control group than full-time dentists for a comparison in evaluating the care abilities of dental trainees.

The purpose of this study was to compare work outcomes and income generated between trainees and part-time dentists working at the Tokyo Dental College Suidobashi Hospital in order to clarify the treatment capabilities of the former.

Materials and Methods

1. Participants

The participants were classified into one of the following two groups: a postgraduate dental trainee (DT) group (15), or a part-time dentist (PT) group (22). The PT group consisted of clinical instructors and dentists responsible for outpatient treatment affiliated with the Division of General Dentistry at Tokyo Dental College Suidobashi Hospital in FY 2012. Demographic information and number of years of professional experience are summarized in Table 1.

2. Calculation methods

We calculated mean values using actual monthly numerical values obtained from 20 full-time dentists in charge of outpatient dental care only and affiliated with the same

Table 1 Demographic information, years of professional experience and monthly work attendance of participants

	n	Male	Female	Years of experience (mean ± SD)	Work attendance (per month) (mean ± SD)
DT group	15	4	11	—	1–25 days (12.45 ± 4.08)
PT group	22	16	6	2–41 years (10.68 ± 11.17)	1–22 days (9.49 ± 0.62)
Full-time dentists group	20	14	6	2–33 years (11.45 ± 10.28)	13–24 days (17.31 ± 1.02)

DT group: postgraduate dental trainees group, PT group: part-time dentists group.

division in the same year. Since month-to-month figures vary widely in terms of treatment days, numbers of outpatients, and dental services income, the monthly figures of full-time dentists were selected as the standard for single-month indices. Using the calculated mean values as indices, percentages were calculated for the data obtained for all the items listed below. Months in which treatment days were zero due to factors such as assignments elsewhere or business trips were excluded from the calculations.

The number of days on which the participants performed dental treatment (including diagnosis) and the total number of patients who received dental treatment (including diagnosis) were calculated in monthly units. The insurance-based dental treatment unit income per patient (insured care unit income)—that is, dental services income from insured care provided by both groups—was also calculated in monthly units. Each result was divided by the total number of patients for that month to obtain these amounts. For self-paid dental treatment unit income per patient (patient-paid care unit income), dental services income provided by both groups was calculated in monthly units.

3. Analysis methods

A monthly comparison was made using the PT group as the control for all categories. To analyze treatment days, total number of patients, and insured care unit income, the 1-year period investigated was divided into the

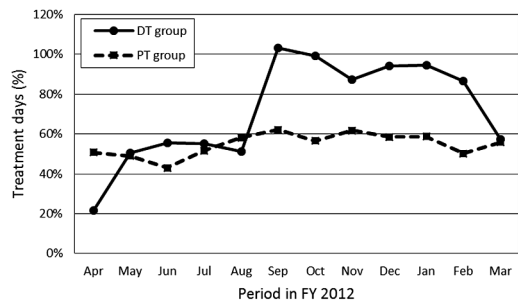


Fig. 1 Treatment days

following three terms: first-term training (April–July); mid-term training (August–November); and final-term training (December–March). The Mann-Whitney U test was used to investigate differences between the DT and PT groups, with $p < 0.01$ considered to indicate statistical significance. Ekuseru-Toukei 2012 (Social Survey Research Information Co., Ltd., Tokyo, Japan) was used for the statistical analysis.

Results

1. Treatment days

In the PT group, the number of treatment days was fairly consistent over the 1-year period (Fig. 1). In the DT group, the lowest number of treatment days was observed in April. From May to August, the number of treatment days was approximately the same for both groups. The DT group surpassed

Table 2 Per term treatment days, total number of patients, care unit income

		First-term training		Mid-term training		Final-term training	
		average	S.D.	average	S.D.	average	S.D.
Treatment days (%)	DT group	46.1	18.3	83.9	44.4	82.9	43.3
	PT group	48.3	24.0	58.5	29.7	54.7	32.4
Total number of patients (%)	DT group	6.9	3.1	22.0	14.4	28.7	15.9
	PT group	21.6	18.0	34.6	19.8	38.4	26.7
Insured care unit income (%) ^{a)}	DT group	42.7	16.1	93.6	26.0	100.5	61.0
	PT group	82.1	50.7	99.7	32.3	108.3	40.2
Patient-paid care unit income (%) ^{a)}	DT group	0.4	1.9	1.4	4.9	10.0	33.3
	PT group	18.7	41.7	37.0	116.9	44.4	108.6
Sample numbers ^{b)}	DT group		29		41		43
	PT group		79		83		85

*p<0.01

^{a)}Care unit income per patient, ^{b)}Total number of dentists for each term.

the PT group from September to February, however, with the results for the former almost equaling those for full-time dentists. In March, the number of days was almost the same between the two groups.

No significant difference was observed in number of treatment days during first-term training between the DT and PT groups (Table 2). On the other hand, the DT group had significantly more treatment days in the mid-term and final-term training periods.

2. Total number of patients

The total number of patients treated was lower for the DT than the PT group throughout the 1-year period (Fig. 2). The PT group had fewer total patients in the first term (April–July), with a tendency toward increased numbers of patients treated starting in August. Meanwhile, the DT group also treated fewer patients in the first term—that is, directly after the start of their training period from April through August—with a tendency toward increased numbers of patients treated starting in September. Even at their maximum numbers, however, the DT group's patient numbers were still around 30% of the number of patients treated by the full-time dentists.

Comparing the two groups by term, while

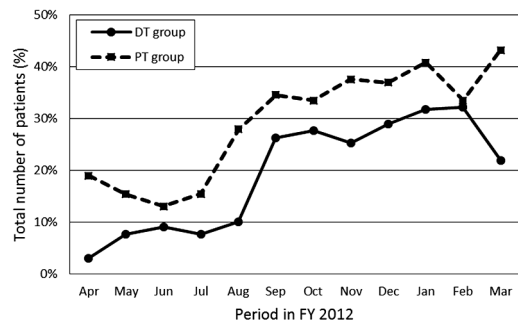


Fig. 2 Total number of patients

the DT group had significantly fewer total patients than the PT group in both first-term and mid-term training, no significant difference was found for final-term training (Table 2).

3. Insured care unit income per patient

Insured care unit income tended to be low from April to July in both groups, and particularly in the DT group (Fig. 3). Starting in August, however, unit income in both groups was approximately the same as that of full-time dentists. Directly before the end of their clinical training period (February and March), the DT group showed higher care unit income than the full-time dentists.

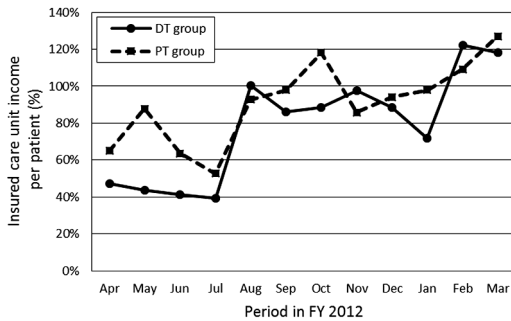


Fig. 3 Insured care unit income per patient

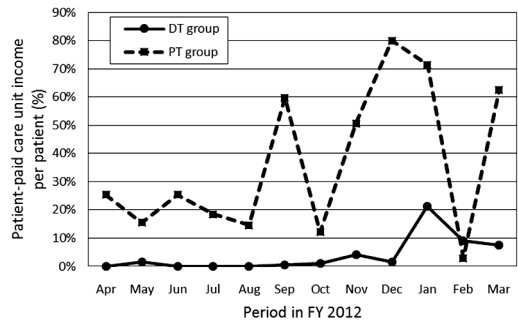


Fig. 4 Patient-paid care unit income per patient

When comparing the two groups by term, the DT group's unit income was significantly lower during first-term training, but no significant differences were found for either mid-term or final-term training (Table 2).

4. Patient-paid care unit income per patient

In terms of patient-paid care, the result for the DT group was nearly zero from April through December (Fig. 4). While the PT group did perform patient-paid care throughout the 1-year period, it was generally at a lower level than that of full-time dentists.

Discussion

1. Reason for selecting PT group as control group

In principle, both full-time dentists and dental trainees provide dental care on days when the hospital is open to the public. However, full-time dentists at our hospital provide highly specialized dental care, while trainees, who are in their first year of clinical training, are expected to take care of more basic procedures. As most of our part-time dentists also provide general dental care when they are working at a private dental clinic, we believed that they would make a better control group for a comparison with the trainees than full-time staff.

2. Calculation methods

Some of our dental trainees are seconded

to other clinical training facilities under the training program on a first-term, mid-term, and final-term unit basis, and there are months when they provide care for zero days at our hospital. This phenomenon also occurred from time to time in the PT group. This is why the numbers in each group varied for each term (Table 2). Therefore, only months in which care was provided were included in the analysis. Moreover, to eliminate the effects of persons having zero care days, calculations were based on the term.

3. Treatment days

After completing their mid-term training (August), the trainees are expected to take full charge of each patient's care. This explains why the number of treatment days shows a significant increase over that of the part-time dentists at this point (Fig. 1 and Table 2). Other factors that directly influence this include the increase in the number of patients they are responsible for, the fact that they are newly charged with the routine work of preliminary dental duties performed by the doctor-in-charge (in a rotation system), and the emergence of a stronger motivation to perform care as a dental trainee.

April, the month in which the trainees commence training, saw the lowest number of treatment days in the DT group. This is because they cannot provide treatment during hospital hours as they have to take part in other activities such as orientation and lectures. Moreover, they are still only responsible

for a small number of patients at this time point, and are mostly involved in observing treatment by a supervising dentist.

There was also a decline in the number of treatment days in March. This may have been because the trainees were preparing to commence new jobs outside the following month now that their 1-year clinical training program was drawing to a close. Indeed, this was one of the reasons giving for their using up paid holiday time at this point.

4. Total number of patients

The DT group treated fewer total patients than the PT group over the 1-year period investigated. When considered together with the results for treatment days, this fact makes clear the time-related care inefficiencies associated with dental trainees. Nevertheless, the significant difference between the two groups in total number of patients disappeared in the final term, which suggests that the level of skill in the trainees had grown over the 1-year period (Fig. 2 and Table 2).

Time-related care-efficiency improvements are required in order to increase the total number of patients. When the dental trainee is performing care, extra time is required for making reports and listening to and trying to follow the suggestions and guidance provided by the supervising dentists. This has a negative impact on efficiency in terms of time. While improving the knowledge of the dental trainees could possibly reduce time taken to consult with guiding dentists, such supervision must not be neglected, as patient safety is paramount. For further time reductions, there must be a decrease in actual treatment times; that is, it is imperative that manual skills be improved. Incorporating novel training elements, such as performing more simulations in skills labs, might be effective in helping to resolve this issue^{8,12}.

5. Insured care unit income per patient

Care unit income in the DT group no longer differed from that in the PT group after completion of mid-term training, which suggests that the diagnostic and treatment

skills of the dental trainees had improved (Fig. 3 and Table 2).

Treatment available under insurance does not usually take long or involve numerous procedures, which naturally limits unit income. This also applies to dental clinics, where approximately 40% of dental trainees undergo their clinical training^{9,13,15}. In this study, the rates in the DT group during the final term were not inferior to those of full-time dentists, indicating that the trainees were securely performing ordinary insured care-related work.

In terms of dental care (diagnosis and treatment), the present results showed that the trainees were directly responsible for only a few patients during the first term, and that care efficiency was poor throughout the 1-year program. However, by the final term of training, trainee-provided care had improved to levels equivalent to those of part-time dentists. Moreover, by mid-term training, insured care unit income per patient showed little difference between the trainees and full-time dentists.

6. Patient-paid care unit income per patient

Patient-paid care was almost zero in the DT group (Fig. 4). The dental trainees are all insured care provision dentists. In Japan, the ratio of insured care earnings to overall earnings at dental clinics is 99.8%¹¹, and all general and basic dental care acts are covered by health insurance. The fact that dental trainees almost never perform patient-paid care in their first year of clinical practice is an inevitable result of Japan's national health care insurance system.

There was, however, a slight increase in patient-paid care in the final term of training. This may have been due to newfound confidence in their ability to explain the availability of such care to the patient more proactively. This is also thought to reflect an improvement in the dental care skills of the dental trainees.

7. Limitations of this study

The environment for our study was a dental university hospital, and thus our results may not be directly applicable to other postgraduate

clinical training facilities, such as dental clinics or dental departments at other kinds of hospital. However, fewer than 60% of dental trainees undergo clinical training at a dental university hospital⁶⁾. Therefore, we believe that the present results could potentially serve as a reference for other such training programs and facilities⁷⁾.

Dental trainees can also gain experience in hospital wards, as this offers the opportunity to encounter both hospitalized patients and surgical cases. However, in terms of dental services remuneration, such services are not calculated as revenues generated by dental trainees. Further, such in-hospital cases are fewer than outpatient cases. Therefore, part-time dentists in charge of outpatient care alone were selected for the control group in this study. It is also important to note that the PT group comprised dentists with a wide range of professional experience.

Conclusion

The present results showed that the trainees developed sufficient diagnostic and treatment skills to tackle basic procedures covered by health insurance by mid-term in the training program, even though inefficiencies were observed in terms of time taken per patient.

This indicates that the clinical training program is effective in giving the trainees the targeted skills. However, these results also suggest that work productivity among dental trainees could further be improved by devising specific training policies and strategies aimed at increasing time-related care efficiency.

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