

Associations among distributions of dental postgraduate residents, dentists and clinical training facilities in Japan

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Abstract: The purpose of this study was to evaluate the correlation and distribution of dental postgraduate residents, dentists and clinical training facilities in each prefecture to analyze the regional distribution and supply of dentists in Japan. The results were also compared with referential data for medicine. The coefficient of correlation between the dentist index and dental postgraduate resident index was $r = 0.76$ ($P < 0.001$) in 2006. The distribution (coefficient of variation) was greatest for the dental postgraduate resident index. The numbers of dentists per 100,000 population in prefectures with dental colleges were significantly higher in 1986, 1996 and 2006 for each comparison ($P < 0.001$). Coefficients of correlation between dentist index and dental postgraduate resident index were $r = 0.65$ ($P < 0.01$) in prefectures with dental colleges and

$r = 0.11$ in those without dental colleges in 2006. The prefectures with high level of numbers of cooperative-type clinical training facilities had dental colleges. (J Oral Sci 51, 635-639, 2009)

Keywords: clinical training facility; postgraduate resident; dentist.

Introduction

Provision of effective dental services requires maintenance of a balance between the number of dentists and dental clinics and the population through resolution of regional differences and urban concentrations (1-3). Every year, many dental practitioners graduate from Japan's 29 dental universities and schools (dental colleges), and this has a particularly significant impact on the number of dentists in prefectures with dental colleges (1). Policies for compulsory postgraduate clinical training to normalize the number of dentists and rectify the uneven regional distribution of dental clinics are required, in addition to efforts aimed at resolving regional differences in dental health care services (2,3). Therefore, evaluation of the

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status of dental postgraduate residents as new entry dentists is important for assessment of uneven regional distributions and the need for dentists. Some previous studies have investigated the distribution of dentists or physicians (1,4,5). In Japan, the dental postgraduate clinical training program was systematized only as recently as 2006. In the Survey of Physicians, Dentists and Pharmacists conducted in December of that year, the number of postgraduate residents was investigated for the first time. However, no detailed analysis has employed those data to compare the numbers of physicians and dentists, including medical and dental postgraduate residents. Furthermore, although there have been plans to examine the national standards of courses after the completion of dental postgraduate clinical training, no detailed report has yet emerged.

In this study, we examined the correlations and distributions of dental postgraduate residents, dentists and clinical training facilities in each prefecture compared with referential data for medicine to analyze the regional distribution and the supply and demand for dentists in Japan.

Materials and Methods

The numbers (rate) for each prefecture compared with the national totals of clinical training facilities and capacity for admission of dental colleges and medical colleges in 2006 were calculated and examined on the basis of publications of each college, Ministry of Health, Labor and Welfare, Ministry of Education, Culture, Sports, Science and Technology, Health and Welfare Statistics (6). In this study we defined and calculated the dental postgraduate residents (dental resident) index, the dentist index, the medical postgraduate residents (medical resident) index and the physician index against the comparative values for each prefecture as the national average (100) of the numbers per 100,000 population, based on the results of the Survey of Physicians, Dentists and Pharmacists for 1986, 1996 and 2006 (7,8).

For statistical analysis, coefficients of variation (CV) were determined for comparisons of variability. Spearman correlation coefficient test and *t*-test were used for comparisons between two sub-groups.

Results

The total nationwide numbers of dental residents, dentists (practicing dentists), medical residents and physicians (practicing physicians) in 2006 were 2,481, 94,593, 14,402 and 263,540, respectively. The numbers of dental residents, dentists, medical residents and physicians per 100,000 population were 1.9, 74.0, 11.3 and 206.3, respectively. Each value was calculated with an index of 100. The

coefficient of correlation between the dentist index and the dental resident index was $r = 0.76$ ($P < 0.001$) and that between the physician index and the medical resident index was $r = 0.48$ ($P < 0.01$). The coefficient of correlation between the capacity for admission at dental colleges and the dental resident index was $r = 0.82$ ($P < 0.001$) and that between the capacity for admission at medical colleges and the medical resident index was $r = 0.32$ ($P < 0.05$). The distribution (CV) was greatest for the dental resident index. The numbers of dentists per 100,000 population (mean \pm SD) were 54.7 ± 10.8 in the group with dental colleges in each prefecture ($n = 19$) and 42.3 ± 6.0 in the group without dental colleges in each prefecture ($n = 28$) in 1986. The corresponding values for 1996 and 2006 were 69.5 ± 14.1 and 51.7 ± 4.8 , and 77.9 ± 13.3 and 58.9 ± 5.4 , respectively. For each comparison, the numbers in prefectures with dental colleges were significantly higher ($P < 0.001$). The increases in the numbers of dentists per 100,000 population from 1996 to 2006 were small over the period from 1986 to 1996 in most prefectures. The distributions (CV) of single-type, management-type, and cooperative-type facilities were wide, and some prefectures lacking single-type and management-type facilities were recognized (Table 1).

The coefficients of correlation between the dentist index and the dental resident index in 2006 were $r = 0.65$ ($P < 0.01$) with dental colleges ($n = 19$) and $r = 0.11$ without dental colleges ($n = 28$). The mean number of cooperative-type clinical training facilities in each prefecture in 2006 was 27.3 ± 35.8 , and the seven prefectures with the high level of numbers of these facilities ($>$ mean + SD) also had dental colleges (Fig. 1).

Discussion

The Medical Practitioners Law and Dental Practitioners Law were both revised in 2000 to make postgraduate clinical training compulsory for physicians in 2004 and for dentists in 2006. Postgraduate clinical training facilities are classified into single-type, management-type, and cooperative-type facilities (2,3). Clinical training can only be completed at a single-type facility, but is also being implemented at group-type facilities (combined clinical training at management-type and cooperative-type facilities). Postgraduate clinical training is already being implemented in many facilities. The distribution of such clinical facilities is considered to have an effect on the courses taken by dental residents after the completion of postgraduate clinical training. Clinical training facilities for medical postgraduate clinical training program are required to be located in second-grade medical care areas, but there is no such stipulation for dentistry (2,3). The

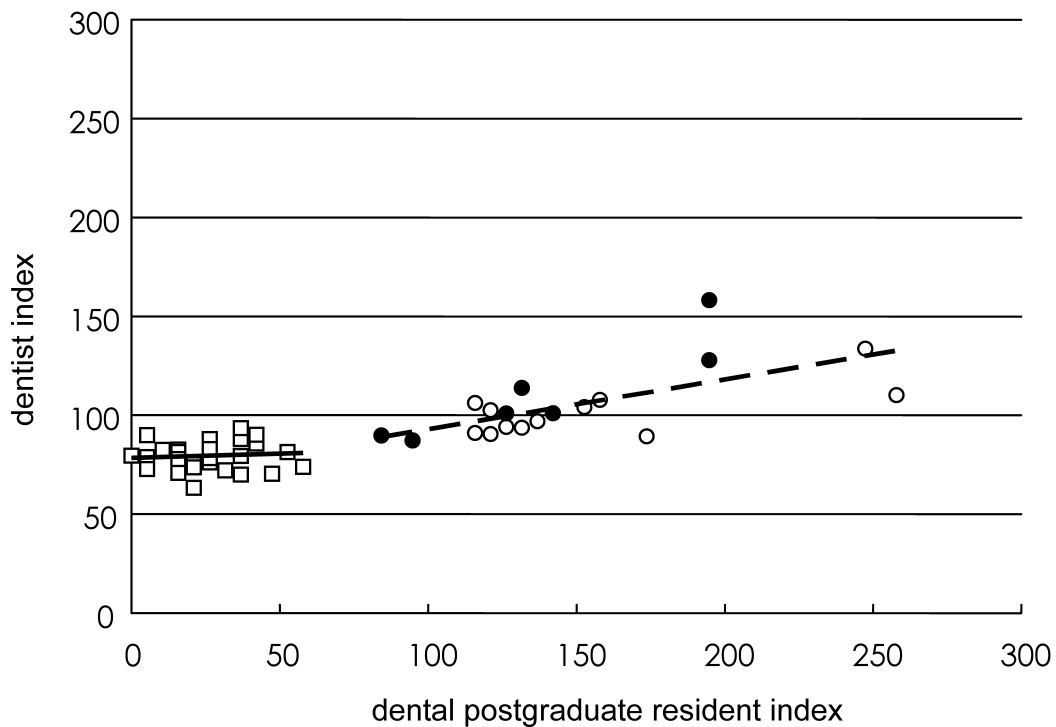


Fig. 1 Correlation of dentist index and dental postgraduate resident index according to prefectures with or without the dental colleges in 2006.

○: the group with the dental college in each prefecture

□: the group without the dental college in each prefecture

●: high level of numbers of cooperative-type clinical training facilities

dashed line: the group with the dental college regression ($y = 0.2513x + 67.84$, $r = 0.65$, $P < 0.01$)

solid line: the group without the dental college regression ($y = 0.0433x + 78.419$, $r = 0.11$)

groups of management-type clinical training facilities for dentistry differ considerably from those in medicine, and many straddle prefectures and have formed groups with cooperative-type facilities. The presence or absence of a dental college has a large effect on the number of dental residents in a particular area. Transfer of dental residents and enhancement of cooperative-type clinical training facilities in regions with a small percentage of dentists are considered to help in alleviating uneven regional distributions.

The increase in the numbers of dentists per 100,000 population from 1996 to 2006 was an improvement over the period from 1986 to 1996. However, the gap due to the presence or absence of dental colleges has not improved, and in fact has increased with a clear difference in absolute numbers. The quality and quantity of required dental care vary as the population of a prefecture rises and falls, but any regional gap is likely to increase further, depending on differences in the numbers of new dental residents. The effect of the presence of a dental college on the number of dentists and dental residents in a particular area can be

verified through comparison with data for medicine. The percentage of new-entry medical residents at medical universities and hospitals affiliated to medical schools (medical university hospitals) decreased from 72.5% in 2003 to 44.7% in 2006 (6,9). Physicians are increasingly selecting clinical training hospitals over university hospitals for postgraduate clinical training due to implementation of new postgraduate clinical training program. Increased separation of physicians from medical university hospitals had led to a decrease in the supply of physicians from these hospitals in prefectures with few practitioners. Regional medicine has been influenced by the new medical postgraduate clinical training program that was instituted in 2004, and this is now accelerating the shortage of physicians in certain regions and widening regional differences in services. The proportion of dental residents at dental university hospitals was 85.3% in 2006 (6,9), but since many of them become dental practitioners at dental clinics after completion of clinical training, the percentage remaining at university is not large. Thus, it is considered that the increasing trend seen in medicine is not connected

to dentistry because of the difference in the system for dispatching practitioners from university hospitals. The quantitative and qualitative improvement of postgraduate clinical training in national cooperative-type facilities may have an influence on the distribution of new-entry dentists and contribute to establishment of an effective regional dental health care service. From now on, we consider that it is necessary to examine and analyze the national standard of courses for dental residents after the completion of postgraduate clinical training, to improve regular numbers and programs of dental postgraduate residents, and to analyze the correlation between the numbers of dental clinics, dental expenditure and the numbers of patients.

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