Working Conditions of Dental Hygienists Employed in Japanese Hospitals

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Objective: Although the number of dental hygienists employed in hospitals has increased in recent years, few studies have examined their working conditions. The purpose of this study was to analyze the working conditions of dental hygienists employed in hospitals, and to investigate any differences according to hospital characteristics.

Methods: This study was based on anonymous data obtained in the Survey of Dental Hygienists Working at Hospitals conducted by the Japan Dental Hygienists Association in December 2016. Among the 1,163 respondents, 1,085 answered questions regarding the number of beds and the dental-related clinical specialties in the hospital where they work, were included in this study. Based on the number of beds and dental-related specialties, hospitals were divided into four groups. The chi-square test was used to test the differences in proportions between the groups. p-values less than 0.05 were considered statistically significant.

Results: Among the four groups, there were significant differences in respondent age, length of service, the reasons why respondents were initially hired in the hospitals, the number of dental-related specialties claimed by the hospitals, and the main focus of the hospitals (such as ambulatory service or inpatient service) (p < 0.05).

Conclusion: This study revealed significant differences in the working conditions of dental hygienists depending on the size and characteristics of the hospitals.

Keywords: dental hygienist, hospital, working conditions

Introduction

The number of dental hygienists working in Japan has been increasing every year. As of the end of 2016, 123,831 dental hygienists were employed, and 112,211 (90.6%) of them were working in clinics. Hospitals were the next most common place of employment (6,259 persons, 5.1%) [1].

Japan’s Medical Care Act defines medical institutions with at least 20 beds as hospitals, while those with no beds or 19 or fewer beds are defined as clinics [2]. Furthermore, Japanese medical institutions providing dental care can advocate the following four specialties: Dentistry, Pediatric Dentistry, Orthodontics, and Oral and Maxillofacial Surgery [3].

The increase in the number of dental hygienists employed...
in hospitals is likely due to the fact that, since April 2012, Japan’s medical insurance has evaluated efforts to manage oral function during the perioperative period (hereinafter referred to as ‘perioperative oral function management’ [POFM]). Recent studies by Japanese research groups as well as those from other countries have provided a variety of evidence showing POFM contributes to the prevention of postoperative aspiration pneumonitis and shortens hospital stays [4-8]. Furthermore, POFM seems to have contributed not only to the increase in the number of dental hygienists, but also to changes in the types of work performed by dental hygienists. The types of work performed by dental hygienists in Japan are roughly divided into three categories: preventive treatment for dental and oral diseases, dental health guidance, and assistance during dental treatment according to the instructions of dentists [9].

In addition, the recently published studies providing evidences on that the relation between oral status and cognitive function of inpatients acknowledge the importance of care for hospitalized patients, such as rehabilitation as well as care during the perioperative period, and that this relation also affects to changes in the work of dental hygienists work [10,11]. Moreover, dental hygienists employed in hospitals are thought to be engaged in a wider range of responsibilities than are those employed in clinics; for example, they may act as a member of the medical-care team in the hospital and be involved in a liaison role between the hospital and dental clinics nearby to facilitate hospital-clinic cooperation. Little research, however, has been conducted regarding these conditions of employment.

The Survey of Dental Hygienists Working in Hospitals conducted by the Japan Dental Hygienists Association in 2016 was the first large-scale survey of dental hygienists working in Japanese hospitals, and more than 1,000 dental hygienists, about 20% of dental hygienists working in hospitals, responded [12]. In the survey report, analyses were performed according only to the respondents’ age and length of service.; analysis of the actual work conditions of dental hygienists according to hospital characteristics was not sufficiently performed.

Table 1. Comparison of the number of hospital beds and dental-related specialties of the hospitals

<table>
<thead>
<tr>
<th>Number of specialties</th>
<th>Number of beds</th>
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<tr>
<td></td>
<td>400</td>
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<tr>
<td>0</td>
<td>20</td>
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<tr>
<td>1</td>
<td>297</td>
</tr>
<tr>
<td>2</td>
<td>49</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>All</td>
<td>404</td>
</tr>
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</table>

Figure 1. Age distribution according to group. Hospitals were divided into four groups: 400 beds or more (Group L), 200-399 beds (Group I), 20-199 beds and three dental-related specialties or less (Group S), and 20-199 beds and four dental-related specialties (Group D). Significant differences in the ages of respondents were observed among the different groups (p < 0.05).

Figure 2. Number of dental-related specialties of hospitals in each group. Hospitals were divided into four groups: 400 beds or more (Group L), 200-399 beds (Group I), 20-199 beds and three dental-related specialties or less (Group S), and 20-199 beds and four dental-related specialties (Group D). Significant differences were observed in the number of dental-related specialties of the hospitals among the groups (p < 0.001).
Japan is advancing into an ‘ultra-aged’ society; by the year 2025, one in four people will be considered ‘late-aged elderly’ [8]. As such, it is essential to differentiate the involvement of dental services according to hospital function and improve the efficiency of dental care.

The purpose of this study was to analyze the working conditions of dental hygienists employed by hospitals and to investigate any differences according to hospital characteristics.

**Materials and Methods**

This study was performed with approval from the Ethical Review Board of the Department of Dentistry at Tokyo Medical and Dental University (No. D2018-038).

The following anonymous data obtained in the Survey of Dental Hygienists Working in Hospitals conducted by the Japan Dental Hygienists Association in December 2016 were utilized in this study: the number of beds in the hospital where the respondent was employed, the clinical specialties of the hospital in which the respondent was employed, the respondent’s age, employment status (full or part-time), existence of previous working experience, years of employment at the current hospital, the reasons for the respondents were hired, and items related to the respondent’s current work-type category.

Among 1,163 respondents, 1,085 respondents who reported the number of beds and the dental-related clinical specialties in the hospitals where they work were included in this study.
study. Based on the number of beds and the number of dental-related specialties, hospitals were divided into four groups: 400 beds or more (large-sized hospital, large-scale: Group L), 200 to 399 beds (intermediate-sized hospital, mid-scale: Group I), 20 to 199 beds and three dental-related specialties or less (small-size hospital, small-scale: Group S), and 20 to 199 beds and four dental-related specialties (university hospital with dental school, dental hospital: Group D).

The chi-square test was used to test the differences in proportions between the groups. p-values less than 0.05 were considered statistically significant. If a significant difference was observed as a result of the chi-square test, a residual analysis was performed to clarify which variable produced a significant difference. Variables with an absolute adjusted residual value of 5% and a standard normal deviation value of 1.96 or more were noted as a result of the residual analysis.

Results

Respondents ranged in age from 21 to 65 years, with an average age of 40.3 years.

The number of beds reported by 1,085 respondents and the distribution of the number of dental-related specialties claimed by the hospitals are shown in Table 1. Bipolarization was observed among the 369 respondents who reported 20 to 199 beds, as 136 (36.9%) reported all four dental-related specialties at their hospital, while 141 (38.2%) reported only one. For this reason, we categorized hospitals claiming to have all four specialties into Group D and the others into Group S. Therefore, 404 hospitals (35.3%) constituted comprised Group L; 312 (28.2%), Group I; 233 (21.5%), Group S; and 136 (15.0%), Group D.

There was a significant difference in the age of respondents among the groups (p<0.05) (Figure 1). By residual analysis, the number of respondents in their 20s was significantly lower in Group I and higher in Group D (p<0.05), and the number of respondents in their 30s was significantly lower (p<0.05) in Group S.

There was a significant difference in the number of dental-related specialties claimed by hospitals among the groups (p<0.001) (Figure 2). By residual analysis, ‘0’ and ‘4’ dental-related specialties were observed significantly less, and ‘1’ dental-related specialty was observed significantly more in Group L (p<0.05). In Group I, ‘0’, ‘1’, and ‘2’ dental-related specialties were observed significantly less, and ‘4’ dental-related specialties was observed significantly more (p=0.05). In Group S, ‘0’ dental-related specialties were observed significantly more, and ‘4’ dental-related specialties was observed significantly less (p=0.05).

Significant differences were observed in the numbers of hospitals among the groups claiming no specialty or specialties in dentistry, pediatric dentistry, orthodontics, or oral and maxillofacial surgery (p=0.001) (Figure 3). By residual analysis, the number of hospitals claiming a specialty in dentistry was significantly higher in Group D and significantly lower in Groups L and M (p<0.05). The numbers of hospitals claiming specialties in pediatric dentistry and orthodontics were significantly higher in Group D and significantly lower in Groups L, M, and S (p<0.05). The number of hospitals claiming a specialty in oral and maxillofacial surgery was significantly higher in Groups L and D and significantly lower in Group S (p<0.05). There were significantly more hospitals with no dental-related specialties in Groups S and M and significantly fewer in Groups L and D (p<0.05).

There were no significant differences in respondent employment patterns among the groups (p=0.089) (Figure 4).

There was a significant difference among the groups regarding the year in which respondents started working at their current hospital (p<0.05) (Figure 5). In Group I, significantly fewer began working at their current hospital before 1996, and significantly more began between 1997 and 2006; In Group D, significantly more began working at their current hospital before 1996, and significantly fewer began between 2012 and 2014 (p<0.05). Figure 6 shows the reasons for which respondents in each group were hired (an increase in capacity, to replace retirees, as a back-up, or for other/unknown reasons). There was a significant difference among the groups.
(p<0.001). In Group L, significantly more respondents were hired due to a capacity increase, and significantly fewer respondents were hired due to other or unknown reasons (p<0.05). In Group S, significantly more respondents were hired for other or unknown reasons (p<0.05). In Group D, significantly more respondents were hired to replace retirees, and significantly fewer respondents were hired due to a capacity increase (p<0.05).

Significant differences were observed regarding the prior experience of respondents in each group (p<0.001) (Figure 7). Work experience prior to respondents' current employment was significantly more common in Group I, and no prior experience (new graduates) was significantly less common in

Figure 5. The year in which respondents started working at the current hospital. Hospitals were divided into four groups: 400 beds or more (Group L), 200-399 beds (Group I), 20-199 beds and three dental-related specialties or less (Group S), and 20-199 beds and four dental-related specialties (Group D). Significant differences were observed among the groups (p<0.01).

Figure 6. Initial reasons for employment. Hospitals were divided into four groups: 400 beds or more (Group L), 200-399 beds (Group I), 20-199 beds and three dental-related specialties or less (Group S), and 20-199 beds and four dental-related specialties (Group D). Significant differences were observed among the groups (p<0.001).

Figure 7. Previous work experience. Hospitals were divided into four groups: 400 beds or more (Group L), 200-399 beds (Group I), 20-199 beds and three dental-related specialties or less (Group S), and 20-199 beds and four dental-related specialties (Group D). Significant differences were observed among the groups (p<0.001).

Figure 8. Main focus of the hospitals in each group. Hospitals were divided into four groups: 400 beds or more (Group L), 200-399 beds (Group I), 20-199 beds and three dental-related specialties or less (Group S), and 20-199 beds and four dental-related specialties (Group D). Significant differences were observed among the groups (p<0.001).
Significance differences were observed regarding the main focus of the hospitals in each group \((p<0.001)\) (Figure 8). By residual analysis, in Group L, inpatient dental-care service was significantly more common, and ambulatory dental-care service was significantly less common \((p<0.05)\). In Group I, nutrition-care support was significantly more common \((p<0.05)\). In Group S, inpatient dental-care support was significantly less common, and ‘other’ focuses were significantly more common \((p<0.05)\). In Group D, ambulatory dental-care service was significantly more common, and inpatient dental-care service, nutrition-care support, and ‘other’ focuses were significantly less common \((p<0.05)\). There was no significant difference in the category of liaison role.

Figure 9 shows the current focus of hospitals in each group. Significant differences were observed in ambulatory dental-care service, inpatient dental-care service, home dental-care support, nutrition-care support \((p<0.001)\), and others \((p<0.05)\). No significant difference was observed in the number of hospitals collaborating with other occupations (liaison role). Ambulatory dental-care service was significantly more common in Groups L and D and significantly less common in Groups I and S \((p<0.05)\). Inpatient dental-care service was significantly more common in Groups L and I and significantly less common in Groups S and D \((p<0.05)\). Home-care support was significantly more common in Groups S and D and significantly less common in Group L \((p<0.05)\). Nutritional-care support and liaison role were significantly more common in
Group L and significantly less common in Group D (p<0.05). ‘Others’ was significantly more common in Group S and significantly less common in Group L (p<0.05).

Discussion

This study aimed to clarify differences in the working conditions of dental hygienists according to the size and characteristics of the hospitals where they work.

The size of hospitals in Japan can be usually judged by the number of beds, but the majority of universities with a faculty of dentistry (29 universities) are associated with dental-based hospitals that mainly engaged in outpatient care, and the number of beds in these hospitals may not match the size of the dental treatment service. Ideally, the questionnaire should have asked directly whether the respondent worked in a dental university hospital, and the analysis should have divided the respondents into groups according to their answers of this question. However, unfortunately, the questionnaire used in this study did not ask this question. The number of dental-related specialties can be cited as evidence for determining a hospital’s dental-treatment capacity. All university hospitals with faculty of dentistry advocated all four specialties, but few hospitals (not more than 10) other than those with a faculty of dentistry advocated all four. In our survey, 61.3% of the dental university hospitals had 60 or fewer beds, 35.5% of them had 400 or more (and also included a faculty of medicine), and the remaining hospital had approximately 300 beds.

The previous survey reported that 1,150 dental hygienists were employed by medical-and/or dental-education institutions such as university hospitals [1]. This means that about 20% of all dental hygienists work in hospitals. In this study, the group that reported to work in hospitals with 199 beds or less and stated that their hospitals claimed to specialize in all four areas was classified as ‘dental university hospital’. However, in future studies, it will be necessary to ask more accurate questions regarding the distinctive features of the workplace.

We found that the smaller the number of hospital beds, the smaller the number of dental-related specialties, with the exception of dental university hospitals. The same trend was observed in the previous survey [13]. We also found that dental hygienists are working in hospitals without dental-related specialties. Even in a hospital without a dental-related specialty, various types of work fall within the range of the Dental Hygienists Act, including dental care under the instruction of dentists nearby the hospital and teaching oral-care methods to nurses and other caretakers. However, further investigation is necessary, because the actual conditions of working situations such as these are not fully understood.

Regarding the relationship between the number of hospital beds and the reason for employment, an ‘increase in the number of employees’ was significantly more common among hospitals with 400 beds or more. In addition, a slight increase in the percentage of part-time employees working in the 400-bed or higher group may also be related to the tendency for larger hospitals to increase the number of employees. Further, the introduction of POFM seems to be related to this increase in capacity.

The larger the number of beds, the more frequently respondents answered questions regarding their duties for hospitalized patients. Previous studies have shown that the higher the number of beds, the more likely the hospital incorporates POFM [11]. This relationship indicates that dental hygienists are involved and play a role in POFM.

Dental hygienists are assumed to have mainly assistive dental-care duties in POFM. However, we anticipate that the role of dental hygienists will change substantially as a result of the expansion of POFM. On the other hand, in dental university hospitals, the number of inpatients is lower than that in general hospitals and the number of outpatients is larger, leading to more dental hygienists being dedicated to outpatient treatment.

The main finding of this study was that it revealed significant differences in the working conditions of Japanese dental hygienists, depending on the size and characteristics of the hospitals. The results provide important basic data for examining the appropriate role of dental hygienists based on individual hospital characteristics.

Future studies are needed to investigate the link between dental hygienists and other health professionals in the hospital, as well as the differences in types of work of dental hygienists in hospital functional differentiation.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.
References


