Working Environment Factors Associated with Regular Dental Attendance

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Abstract

The aim of this study was to identify factors in the working environment associated with regular dental attendance. Thirty-three general practitioners provided data on 488 patients who underwent dental maintenance between 2003 and 2015. The age of the patients ranged from 40 to 65 years. Appointment adherence, employment format, overtime work, night work, and subjective evaluation of work were investigated. Multiple logistic regression analysis was performed to identify factors associated with regular dental attendance. Among all participants, 296 (60.7%) were female, 320 (65.6%) worked full-time, 193 (39.5%) worked overtime, and 34 (7.0%) worked nights. The results of the analysis revealed that only night work was a significant factor after adjusting for sex, age, and employment format (odds ratio, 0.220; 95% confidence interval, 0.088–0.550). The results of this study suggest that night work disturbs regular dental attendance.

Key words: Working conditions — Regular dental visits — Night work — Appointment adherence

Introduction

Long-term dental attendance is effective in preventing oral disease⁵. Therefore, regular dental attendance is very effective in maintaining good oral conditions. An association
between job and oral conditions has been reported. Suzuki et al. reported that professional drivers had fewer teeth than white-collar workers\textsuperscript{10}. In addition, Ishizuka et al. found that night shift workers were more likely to report gingival bleeding and stomatitis than daytime-only workers\textsuperscript{5}. These reports suggest that the working environment affects oral condition. Therefore, our hypothesis was that the working environment affected oral condition by preventing regular dental attendance. The aim of this study, therefore, was to identify working environment factors associated with regular dental attendance.

**Methods**

Questionnaires were sent to 33 dentists, all of whom were members of the Japan Health Care Dental Association and general practitioners who operated a patient recall system aimed at preventing tooth loss through providing dental maintenance. All the patients participating in this study were aged between 40 and 65 years; all commenced receiving dental maintenance between 2003 and 2007; and all had experience of labor. These participants were required to complete a self-reported questionnaire in 2015. The questionnaire items concerned factors associated with the working environment and are listed in Table 1. In terms of regular dental attendance, the focus was on the appointment adherence rate. Accordingly, the dentists enlisted were requested to provide the record of appointment adherence for the stipulated observation period, which spanned 2003 to 2015. For the analysis, the patients were divided into two groups in accordance with the method of Miyamoto et al.\textsuperscript{9}: those who kept at least 70\% of their appointments during the observation period and those who did not. Multiple logistic regression analysis was performed using appointment adherence as the dependent variable and sex, age, employment format, overtime work, night work, and subjective evaluation of work as independent variables. Among these independent variables, sex, age, and employment format were entered into the model as adjustment factors by using the forced entry method. The patients were subsequently divided into the following two groups based on age: $<60$ years or $\geq60$ years, as the retirement age is set at 60 years in Japan\textsuperscript{7}. The lower limit of the age range was set at 40 years, as the proportion of persons with missing teeth increases at around

| Table 1 | List of self-reported questionnaire items |
|---------|------------------------------------------|
| **Items** | **Category** |
| Employment format |  |
| What is your employment format? | Part-time or full-time work |
| Overtime work |  |
| Do you have overtime work? | Yes or no |
| Night work |  |
| Do you have night work? | Yes or no |
| Subjective evaluation of work |  |
| Do you engage in active work? | Yes or no |
| Are you very tired of work? | Yes or no |
| Do you feel vigorous during your work? | Yes or no |
| Can you settle into your work? | Yes or no |
| Can you concentrate on your work? | Yes or no |
| Do you grow tense during your work? | Yes or no |
that age according to the Survey of Dental Diseases in Japan\(^6\). The multiple logistic regression analysis was developed using the forward selection method, and the criterion for obtaining the final model was a p value of <0.05. Data were analysed using the computerized statistical package SPSS, version 22.0 (SPSS Japan Inc., Tokyo, Japan). The level of significance was set at 5%. This study was approved by the Ethics Committee of Tokyo Dental College (approval number: 599).

**Results**

A total of 488 participants were analyzed, of which 60.7% were female. The prevalence of participants with an appointment adherence of \(\geq 70\%\) was \(>90\%\). In addition, 65.6% of participants worked full-time, 39.5% worked overtime, and 7.0% were night workers. The following results were obtained for subjective evaluation of work: 71.7% reported being engaged in active work; 18.2% said they were very tired of work; 60.7% said they felt vigorous during work; 1.4% said they could not settle into their work; 3.9% said they could not concentrate on their work; and 38.3% reported growing tense during work. These data are summarized in Table 2. Table 3 shows the results of the multiple logistic regression analysis. Only night work was identified as a significant factor after adjusting for sex, age, and employment format (odds ratio, 0.220; 95% confidence interval, 0.088–0.550).
Discussion

The results of this study revealed that night work may prevent regular dental attendance among workers. The data revealed that the percentage of employees adhering to <70% of appointments was higher among night workers (8 out of 34 (23.5%)) than among non-night workers (34 out of 454 (7.5%)). Meanwhile, subjective evaluation of work showed no association with regular dental attendance. These results suggest that environment is more closely associated with regular dental attendance than subjective evaluation. Unfavorable health conditions among night workers have been reported \(^8\). Furthermore, a relationship has also been noted between night shift work and decayed teeth \(^5\). With respect to lifestyle, Han \textit{et al.} reported that night shift nurses had more unhealthy dietary behaviors than nurses without night shifts in a study of 340 hospital nurses \(^6\). Moreover, Knutsson found that shift work was associated with stress and behavioral changes and eventually caused disease \(^6\). Taken together, these studies suggest that night work causes behavioral changes and has a negative effect on health.

Among behavioral changes, trouble sleeping has been reported in night workers \(^11\). Torsvall \textit{et al.} reported that night work is characterized by increased subjective and objective sleepiness, and 28% of participants engaged in night work took a nap in the afternoon \(^11\). The majority of dental clinics are open during the daytime. This means that it may be more difficult for night workers to visit dental clinics due to either sleepiness or sleeping during these hours.

This study had some limitations. No adjustment was made for socioeconomic status, which is associated with regular dental attendance \(^3\). In addition, there was no scope for change of working environment during the observation period.

In conclusion, the results of the present study suggest that night work disturbs regular dental attendance. Further investigation is required to confirm this relationship.

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