

Making Dental Checkups More Accessible to More People and Companies **Hitachi and Lion Confirm that Dental Checkups Prompt Better Employee Oral** **Care Behaviors and May Improve Productivity**

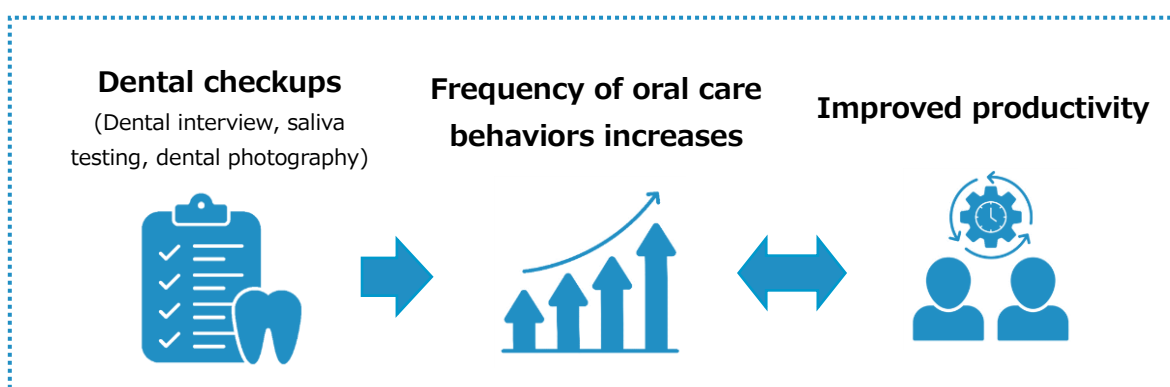
Lion Corporation (President Masayuki Takemori) has partnered with Hitachi, Ltd. And Hitachi Health Care Center*¹ (Hitachi City, Ibaraki Prefecture) to conduct a study on the effects of the introduction of company dental checkups on the oral and general health of employees. As reported in our February 2023 news release,*² it has been confirmed that dental checkups can help improve the oral health of employees and may also contribute to their overall health. In this study, the relationship between some oral care behaviors and productivity was analyzed based on survey data on Hitachi Group employees who underwent comprehensive physical checkups and dental checkups. The results showed that employees who increased the frequency of their oral care behaviors*³ saw significant improvements in their presenteeism,*⁴ an indicator used to evaluate productivity. This finding suggests that changes in oral care behaviors stemming from dental checkups may contribute to improved employee productivity. The study's findings were jointly presented by Lion and Hitachi Health Care Center at the 72nd Annual Meeting of the Japanese Society for Oral Health (JSOH) held from May 19 (Friday) to 21 (Sunday), 2023.

*1 Hitachi Health Care Center: See "Reference Information" on page 4 of this document.

*2 Hitachi and Lion Confirm that Workplace Dental Checkups Contribute to Oral and General Health
https://doc.lion.co.jp/uploads/tmg_block_page_image/file/8696/20230209.pdf

*3 Frequency of oral care behaviors includes employees with an increase in one or more of the following: average daily toothbrushing frequency, flossing rate and frequency of dentist appointments.

*4 Presenteeism: A state of diminished efficiency stemming from attending work while suffering from some illness or ailment.



■ Research Background

As a result of the Basic Policy on Economic and Fiscal Management and Reform 2022 issued by the Japanese government's Cabinet Office, which includes specific consideration for universal dental checkups, there is a growing wave of interest in dental checkups as a way of promoting dental and oral health. At present, however, dental checkups for working age adults are mandatory only for the limited number of workers who handle hydrochloric acid and sulfuric acid (Figure 1), and few companies have proactively introduced them. One reason for this may be the difficulty in getting companies to grasp the merits of introducing systems that provide dental

checkups. A study we conducted in collaboration with Hitachi Health Care Center, served to clarify the utility of such checkups and confirmed that introducing dental checkups as part of corporate health checkups leads to an increase in oral care behaviors among employees and thus an improvement in their oral health. On the other hand, one of the most important ways companies can benefit from implementing health and productivity management that includes dental checkups is an improvement in employee productivity. However, there have been very few studies of the correlation between dental checkups and productivity. Therefore, this study examined the relationship between dental checkups and presenteeism, an indicator used to evaluate employee productivity.

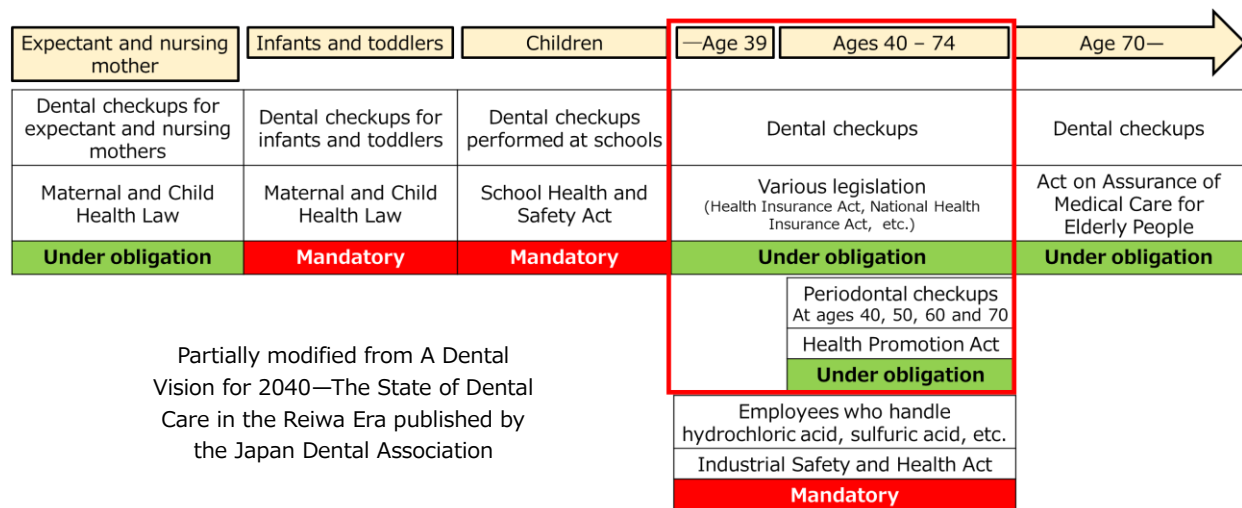


Figure 1. Dental Health Examination System in Japan

■ Research Details

Target group: People who received dental checkups at Hitachi Health Care Center, Hitachi Ltd.

Examination period: April 2018 to March 2020

Number of eligible people: 7,763 (those who had physical and dental examinations in fiscal year 2018 and fiscal 2019)

Dental checkup content:

- Survey of oral care behaviors (e.g., daily toothbrushing frequency, flossing rate, frequency of dentist appointments, etc.)
- Saliva testing (SMT, salivary multi test)
- Dental photography

Analysis items: Association between changes in oral care behaviors and presenteeism (WFun^{*5})

^{*5} WFun: Work Functioning Impairment Scale, one of the presenteeism measurement methods recommended by the Ministry of Economy, Trade and Industry to evaluate degree of work function impairment based on a seven item survey yielding a total score ranging from 7 to 35 points with higher scores indicating greater degrees of impairment. Data extracted from the results of medical interviews conducted as part of employees' comprehensive physical checkups was used for the WFun analysis.

■ Research Results

Presenteeism significantly improved among employees who more frequently practiced oral care behaviors (daily toothbrushing frequency, flossing rate, and frequency of dental appointments)

Previous analysis of survey data on employee oral care behaviors from fiscal 2016, when a dental checkup system was introduced, to fiscal 2019, found that the frequency of oral care behaviors had increased over time. To examine the relationship between said increase and presenteeism, this study categorized employees into a groups whose frequency of oral care behaviors increased,*⁶ remained constant, and decreased, then compared and analyzed changes in these groups' presenteeism from fiscal 2018 to fiscal 2019. Results showed that presenteeism significantly improved in the group with increased oral care behaviors compared with the other two groups (Figure 2).

In addition, as health-related habits like sleep and exercise*⁷ have known links to presenteeism, these factors were taken into account when analyzing the association of oral care behaviors with presenteeism.

Multiple regression analysis*⁸ with presenteeism as the objective variable and oral care behaviors, other health-related habits, age, and gender as explanatory variables revealed a significant association between such health-related habits as sleep and exercise and presenteeism, as had been previously reported. Results also showed that changes in oral care behaviors were associated with presenteeism even when other health-related habits had been taken into account (Figure 3. Partial regression coefficient: 0.23, $p < 0.01$). These findings suggest that improvements in oral care behaviors may, like improvements in other health-related habits, contribute to improved productivity.

*⁶ Increased frequency of oral care behaviors group: One or more of the following increased: toothbrushing frequency, flossing rate, and frequency of dentist appointments.

Constant group: No change in toothbrushing frequency, flossing rate, and frequency of dentist appointments.

Decrease group: One or more of the following decreased: toothbrushing frequency, flossing rate, and frequency of dentist appointments.

Those who did not fall into any of the above categories were excluded from the analysis.

*⁷ Health-related habits examined: Sleep duration, hours of overtime worked, exercise habits, alcohol consumption, smoking habits.

*⁸ Multiple regression analysis: A method of estimating correlation among two or more variables (explanatory variables) when predicting an outcome (objective variable) in mathematical terms.

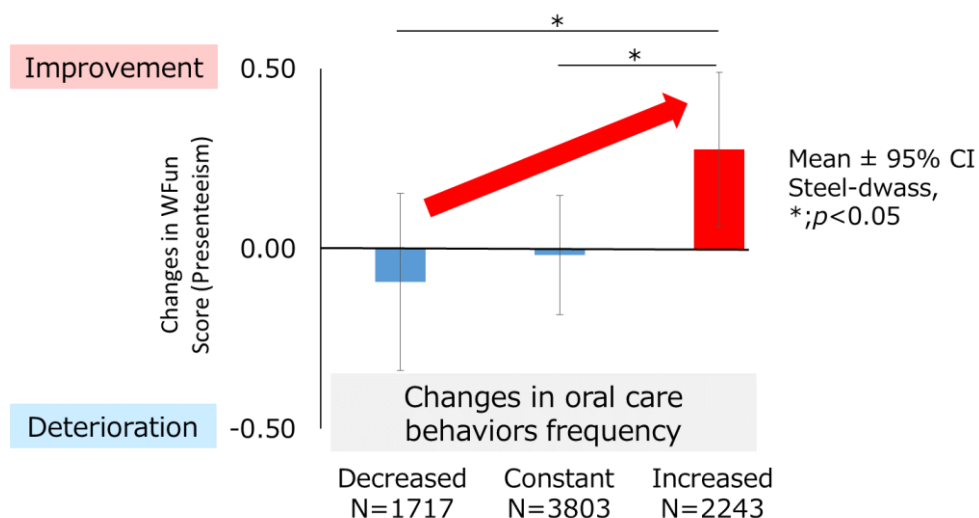


Figure 2. Association of Changes in Oral Care Behaviors with Changes in Presenteeism

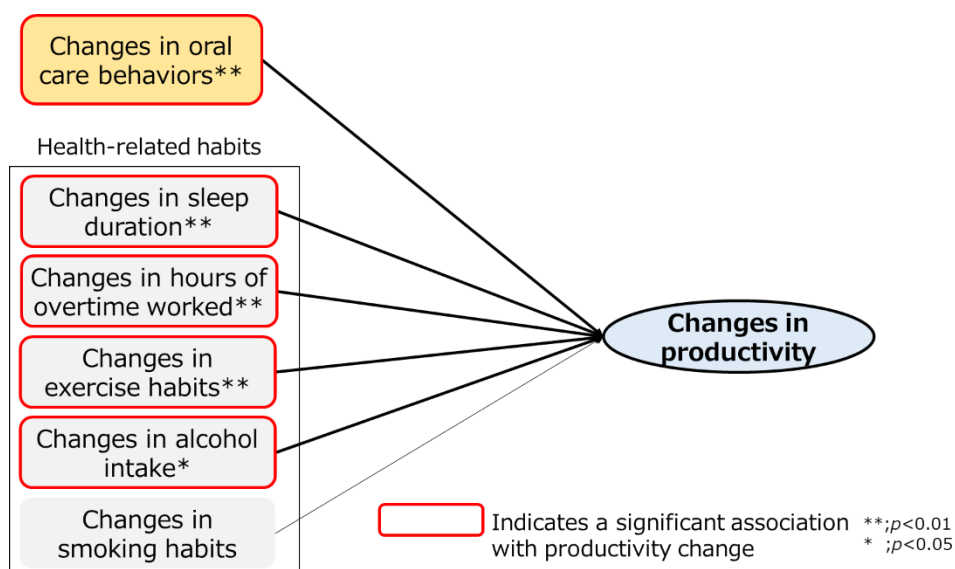


Figure 3. Schematic Diagram of the Association Analysis (Multiple Regression Analysis) Between Changes in Presenteeism, Changes in Health-Related Habits and Changes in Oral Care Behaviors

The research results were presented as below.

【The 72nd Annual Meeting of the Japanese Society for Oral Health (JSOH)
May 19 (Friday) to 21 (Sunday) , 2023】

“The relationship between the oral health and productivity through the introduction of dental checkups”

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■Future Plans

Lion is moving forward with its corporate activities based on the basic approach to the oral health field set out in the Lion Oral Health Initiative.^{*9} As part of the Lion Oral Health Initiative, this research initiative aims to help extend healthy life expectancy from the mouth outward.

^{*9} The collective name for activities in the oral health field aimed at realizing the Company’s long-term strategic framework, Vision2030.

For an overview, please see the announcement published on August 8, 2022.

https://doc.lion.co.jp/uploads/tmg_block_page_image/file/8265/20220808a.pdf

■Reference Information

<Hitachi Health Care Center>

The Center is one of four facilities^{*10} under Hitachi, Ltd.’s Corporate Hospital Group, and provides comprehensive physical checkups for employees of its operating sites, mainly in the Ibaraki area. The Center actively works to improve its employees’ health through measures such as the Harasuma Diet,^{*11} which helps improve metabolic syndrome.

^{*10} Hitachi general Hospital, Hitachinaka general Hospital, Hitachi Health Care Center and Tsuchiura Medical & Health Care Center

^{*11} Registered trademark of Nisseicom, Limited

<Okuchi Plus You>

Lion provides services to corporations, including their employees, to support the development of better oral care habits through saliva testing and education seminars.

▼Details

“Okuchi Plus You” Corporate Well-Being Support Service

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