

学位論文の要旨

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学位論文名 Relationship Between Oral Function and Social Participation Among Community-Dwelling Older Adults: An Observational Cross-Sectional Study

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論文内容の要旨

INTRODUCTION

The older population in Japan has been increasing annually and was reported to be 36.23 million in 2023. Japan's aging rate of 29.1% was the highest ever recorded and among the highest in the world. The aging population is likely to continue to increase with the growing older population and the declining younger generation. Owing to the increase in the older population in Japan, the number of people requiring support and care is also increasing annually. The condition that precedes the need for nursing care is called frailty, and frail prevention is considered important from the perspective of preventing nursing care.

In Japan, the 8020 campaign was employed in 1989 through comprehensive medical cooperation in the community to encourage people to keep at least 20 of their own teeth at the age of 80. As a result of the 8020 campaigns, the oral health status of the older adults in Japan improved over the next 20 years and was eventually included in one of the health promotion laws. In 2016, the introduction of the concepts of oral frailty and oral hypofunction marked a paradigm shift from focusing solely on preserving remaining teeth to emphasizing the maintenance of overall oral function. Oral hypofunction, the next stage of oral frailty, is defined as a condition in which there is no minor loss of function, but rather a combined loss of oral function on oral examination. If left untreated, this oral hypofunction leads to oral dysfunction, such as mastication and swallowing disorders, leading to the progression of malnutrition and sarcopenia and the need for nursing care.

In the progression from health to frailty and physical dysfunction, the step prior to frailty is referred to as pre-frail. Pre-frail is characterized by a lack of social interaction and mental

instability, which leads to a decrease in spontaneity of health behaviors and, concurrently, a decline in interest in oral health. Decreased interest in oral health can lead to the neglect of minor problems, such as dental caries, periodontitis, and xerostomia, increasing the risk of dental disease progression. People with low oral health literacy are reported to have poorer periodontal health and are more likely to develop periodontal disease. Furthermore, people with low oral literacy are unable to take appropriate oral hygiene actions. In addition, it has been suggested that health literacy and social behaviors are related. Low health literacy is significantly associated with fewer opportunities and frequency of receiving social support, with particularly strong effects among socially isolated older adults. Therefore, when the concepts of oral frailty and oral hypofunction were defined in 2016, it seemed reasonable to encompass the association between oral and social behavioral impairments in the conceptual framework. However, to date, there has been no clear evidence demonstrating an association between this minor decline in oral function and social behavior, and a highly sensitive, large-scale study is required. We aimed to examine the relationship between oral function and social participation among older adults living in the community.

MATERIALS AND METHODS

The study participants were aged 75 years and older community-dwelling older adults who underwent dental and oral health examinations and health checkups conducted by the Shimane Extended Union of the Medical Care System for Latter-Stage Elderly People between April 2020 and March 2022. We collected general background data (age, sex, body mass index, lower leg circumference), oral health status (number of remaining teeth, periodontal tissue status, masticatory function, tongue range of motion, articulation, swallowing function, oral hygiene status, dry mouth, and daily frequency of tooth brushing), and social participation data. The social participation items in the questionnaire were, “do you go out at least once a week?” and “do you regularly meet with family or friends?”. Descriptive statistics were calculated as medians and percentages according to variables. Univariate and multivariate analyses were performed using logistic regression. The objective variable was social participation, and the explanatory variables were age, sex, lower leg circumference, masticatory function, swallowing function, oral hygiene status, periodontal tissue status, dry mouth, and daily frequency of tooth brushing. The study protocol was approved by the Research Ethics Committee of Shimane University. (No. 20220723-1)

RESULTS AND DISCUSSION

The participants included 4196 cases, excluding 513 cases with missing data; among them, 1,848 (44.0%) were male and 2,348 (56.0%) were female. The mean age was 78.0 years (interquartile range 77.0–81.0). Logistic regression analysis of the presence of going out at least once a week demonstrated significant correlations in age, lower leg circumference, masticatory function, and oral hygiene status ($p < 0.05$). Significant correlations were found in sex, lower leg circumference, masticatory function, swallowing function, and oral hygiene status for regular meetings with family or friends ($p < 0.05$).

The main finding of this study is the relationship between masticatory function and social participation. Masticatory function refers to the oral ability to break down food into a swallowable form, involving coordinated movements not only of the teeth but also of the entire oral cavity. It has been reported that factors that contribute to the decline of masticatory function are related to loss of teeth and muscle weakness, such as frailty and sarcopenia. A study in England reported that the complete loss of remaining teeth in older adults was associated with a solitary living environment. It has also been reported that those who participate in social activities have a 1.3-fold more remaining teeth than those who do not. Moreover, poor oral function is reportedly associated with worse social withdrawal among older adults. The study results are consistent with those of other studies, as objective masticatory ability has also been reported to be associated with higher daily living ability. Previous research suggests that the observed phenomenon may be explained by a decline in masticatory function leading to reduced cognitive function and motivation, which in turn impacts social participation.

A minor finding of this study is the association between oral hygiene status and social participation. Oral hygiene status has been reported to be associated with cognitive decline among community-dwelling older adults requiring long-term care. An association has also been demonstrated between social isolation and oral hygiene among older adults living independently. Oral hygiene status was associated with social activity; however, one possible cause could be the association of halitosis with social activity. People who experience a psychological burden of halitosis have been reported to fear social opportunities and inhibit social activities. Poor oral hygiene due to dental caries and periodontal disease is remarkably associated with eating alone, and a small number of teeth has been reported to reduce the variety of foods available, resulting in a lower frequency of eating out. Hence, an association between oral hygiene status and social participation is reasonable in this study as well.

In this study, two questionnaire items, “Do you go out at least once a week?” and “Do you usually meet with family or friends?” were employed as indicators of social participation. In Japan, these two questions were used as indicators of social participation and, for example, as outcomes in social intervention studies. The literature review suggests that “going out” and “meeting people” are less affected by cultural heterogeneity. Other social participation outcomes may also include participation in community clubs and volunteer activities. As club activities are strongly influenced by local characteristics and the communities in which they live, different research results may be obtained. Therefore, this study suggests that it is necessary to develop “an indicator to evaluate social activities involving oral function.”

CONCLUSION

The results of this study suggest that the masticatory, oral hygiene, and swallowing functions are associated with social participation. It is considered necessary for oral health care providers to develop oral health care activities while providing opportunities for social participation of the older adults, such as comprehensive community care, to maintain and promote oral health status and function.