



Associations between the number of natural teeth in postmenopausal women and duration of lactation: The 2010–2012 Korea National Health and Nutrition Examination Survey



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ABSTRACT

Objectives: Lactation is reported to be associated with changes in maternal calcium homeostasis. The relationship between lactation and long-term oral health remains to be revealed. This study was aimed to evaluate the relationship between lactation and the number of natural teeth in postmenopausal women using nationally representative data.

Methods: The data from the Korea National Health and Nutrition Examination Survey between 2010 and 2012 were used, and the analysis in this study was confined to 4211 respondents over 19 years old who had gone through menopause and had no missing values for the reproductive factors and outcome variables. The total number of natural teeth was then calculated after excluding third molars. Multiple logistic regression analyses were used to assess the associations of the number of natural teeth and lactation.

Results: As the duration of total lactation increased, the number of natural teeth decreased. Average duration of lactation per child showed similar trends. The association between the total duration of lactation and the number of natural teeth showed an inverse relationship with a beta value of -0.0181 per day after adjustment, and the beta value of the average duration of lactation per child was -0.0287 after the adjustment. The odds ratios of the percentage of individuals with the number of teeth ≤ 27 tended to increase with increased duration of lactation. Adjusted odds ratios and 95% confidence intervals were 1.830 (1.009, 3.320); 1.142 (0.765, 1.704); 1.159 (0.807, 1.664); and 0.857 (0.563, 1.306) for lactation period of ≥ 25 months, 13–24 months, 7–12 months, ≤ 6 months, and no lactation, respectively.

Conclusions: This study investigated the relationship between the number of teeth and the total duration of lactation or an average duration of lactation per child using nationally representative data. Total duration of lactation and average duration of lactation per child were inversely related to the number of natural teeth. Lactation may be considered to be an independent risk indicator for tooth loss in Korean postmenopausal women.

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1. Introduction

Lactation is reported to have various protective effects including reduced risk of breast cancer and rheumatoid arthritis [1,2] and it is reported to be associated with changes in maternal calcium homeostasis [3]. However, the daily loss of calcium in breast milk

has been estimated to range from 250 to 400 mg, but losses may go up to 1000 mg per day [4]. It was suggested that lactation may be a risk factor for low bone mineral density due to the substantial change in bone metabolism [3]. Results regarding the effects of previous lactation on bone mineral density ranged from a decrease to no change [3–5].

Limited research is available about the influence of lactation on the alveolar bone [6]. A previous study suggested that bone loss associated with lactation may be recovered after weaning [3]. The mechanisms underlying the associations between the number of teeth and duration of lactation has not yet been revealed. It is reported that if a pregnancy is followed by a period of lactation

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calcium loss may occur [3]. Previous studies have investigated the effect of calcium deficiency on the alveolar process [7–9]. Calcium deficiency is reported to cause osteoporosis with severe cavitation of the alveolar process [8], and low calcium diet resulted in mobility of incisor teeth in an experimental model [7]. The response to calcium depletion led to a stronger reaction in the alveolar bone than the femoral bone [10]. However, another report showed that a calcium-deficient diet alone caused slightly less bone loss from the mandible than from the long bones [9]. The physiological hypoe-strogenemia and hyperprolactinemia during lactation may result in deleterious effects on the skeleton [3,11,12]. Lactation is reported to affect the rate of maternal dentin apposition and mineralization in the experimental model [13]. The enamel and dentin values were lower in the lactation group and calcium metabolism observed during the lactation may have induced this observation.

The relationship between lactation and long-term oral health is unclear. This study aimed to evaluate the relationship between lactation and the number of natural teeth in postmenopausal women using nationally representative data.

2. Materials and methods

2.1. Overview of the survey and participants

The data used in this study were derived from the Korea National Health and Nutrition Examination Survey (KNHANES), which was conducted between 2010 and 2012 by the Division of Chronic Disease Surveillance under the Korea Centers for Disease Control and Prevention and the Korean Ministry of Health and Welfare [14]. The KNHANES is a nationwide survey of non-institutionalized civilians that uses a stratified and multi-stage probability sampling design with a rolling survey-sampling model. The sampling units were based on the population and housing consensus from the National Census Registry in Korea, which includes age, gender and geographic area. The sample weights were used to calculate all statistics of this survey. Sample weights were created that consider survey non-response, complex survey design and

post-stratification to represent the Korean population with sample participants.

2.2. Menopause and reproductive factors

Initially, 11,138 women (aged 31–97 years) participated in the KNHANES survey. The analysis in this study was confined to 4211 respondents over 19 years old who had gone through menopause and had no missing values for the reproductive factors and outcome variables. Data regarding reproductive factors were collected by asking the participants to recall the age at first and last delivery and the age at menopause, gravidity, parity and lactation. All participants in the survey signed an informed consent form prior to participation. This survey was reviewed and approved by the Institutional Review Board of the Korea Centers for Disease Control and Prevention.

2.3. Sociodemographic and lifestyle variables

Trained interviewers asked all participants about sociodemographic and lifestyle variables. Education level was categorized into two groups using the criterion of high school graduate or higher. Monthly household income was divided into quartiles after adjusting for the number of family members. The first lowest quartile included households with a monthly income <1092.4 USD. Participants were categorized into two groups using the criterion of alcohol consumed within one month of the interview [15]. Smoking status was categorized into two groups in accordance with respondents' answers on the self-report questionnaire: current smoker or not. Based on responses to the modified form of the International Physical Activity Questionnaire for Koreans, individuals were regarded as regular physical exercisers if they performed moderate exercise more than 5 times per week for over 30 min per session or performed vigorous exercise more than 3 times per week for over 20 min per session [16]. A face-to-face interview was used to obtain data about place of residence (rural versus urban) and having a spouse [17].

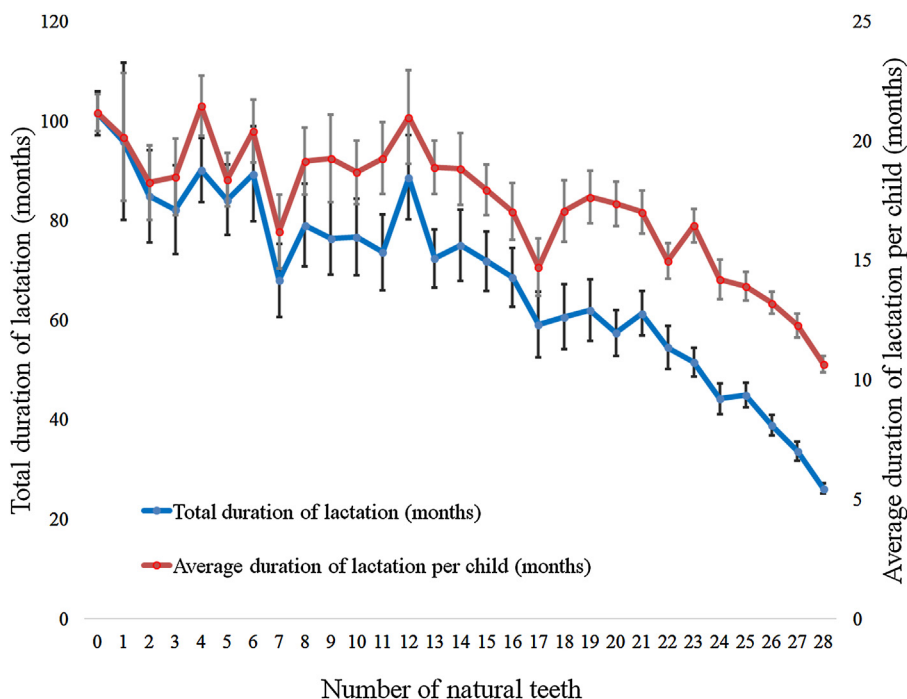


Fig. 1. The number of teeth according to the total duration of lactation (months) or average duration of lactation per child (months) (P for trend <0.001).

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