



저작자표시-비영리-변경금지 2.0 대한민국

이용자는 아래의 조건을 따르는 경우에 한하여 자유롭게

- 이 저작물을 복제, 배포, 전송, 전시, 공연 및 방송할 수 있습니다.

다음과 같은 조건을 따라야 합니다:



저작자표시. 귀하는 원저작자를 표시하여야 합니다.



비영리. 귀하는 이 저작물을 영리 목적으로 이용할 수 없습니다.



변경금지. 귀하는 이 저작물을 개작, 변형 또는 가공할 수 없습니다.

- 귀하는, 이 저작물의 재이용이나 배포의 경우, 이 저작물에 적용된 이용허락조건을 명확하게 나타내어야 합니다.
- 저작권자로부터 별도의 허가를 받으면 이러한 조건들은 적용되지 않습니다.

저작권법에 따른 이용자의 권리는 위의 내용에 의하여 영향을 받지 않습니다.

이것은 [이용허락규약\(Legal Code\)](#)을 이해하기 쉽게 요약한 것입니다.

[Disclaimer](#)

치의학박사 학위논문

Association of intake of thiamine,
riboflavin and niacin with periodontitis
among Korean adults

한국 성인에서 티아민 리보플라빈 및 나이아신
섭취의 치주염에 대한 연관성

2020 년 2 월

서울대학교 대학원
치의과학과 예방·사회치의학 전공

이 정 후

Association of intake of thiamine,
riboflavin and niacin with periodontitis
among Korean adults

한국 성인에서 티아민 리보플라빈 및 나이아신
섭취의 치주염에 대한 연관성

지도교수 김 현 덕

이 논문을 치의학박사 학위논문으로 제출함

2019 년 11 월

서울대학교 대학원

치위과학과 예방·사회치의학 전공

이 정 후

이 정 후 의 치의학박사 학위논문을 인준함

2019 년 12 월

위 원 장	(인)
부위원장	(인)
위 원	(인)
위 원	(인)
위 원	(인)

-Abstract-

Association of intake of thiamine, riboflavin and niacin with periodontitis among Korean adults

Jung-Hoo Lee, D.D.S, M.S.D.

Department of Preventive & Social Dentistry

The Graduate School, Seoul National University

(Directed by Prof. **Hyun-Duck Kim**, D.D.S, M.S.D, Ph. D)

Objective: Adequate intake of vitamin B-complex could be important for oral health. However, few studies reported on the association of individual thiamine (vitamin B₁), riboflavin (vitamin B₂), and niacin (vitamin B₃) with periodontal health. This study described the association between periodontal health and dietary vitamin B₁, B₂, and B₃ intake in the Korean population.

Methods: 12,750 adults aged over 19 years were included for this study as a sub-sample of the national data set from Korean National Health and Nutrition Examination Survey (IV and V). Periodontitis and gingivitis were defined as Community Periodontal Index (CPI) scores of 3-4 and 1-2, respectively. Informations on dietary vitamin B₁, B₂, and B₃ intake were from 24-hour-dietary recall method. Multi-variable complex logistic regression analyses estimated association between vitamin

B₁, B₂, and B₃ intakes and periodontal status after adjusting for various potential confounders. Stratified analyses by age, sex, dyslipidemia and total energy intake were also undertaken.

Results: The weighted prevalence of periodontitis (CPI 3-4) and gingivitis (CPI 1-2) was 29.9% and 46.6%, respectively. Our data showed none of the inadequate intake of vitamin B₁, B₂, and B₃ with gingivitis and vitamin B₁, B₂ with periodontitis showed the significant association after adjusting for various potential confounders. However, inadequate intake of vitamin B₃ showed the significant association with periodontitis by quartile and EAR (adjusted odds ratio (aOR) of vitamin B₃ by EAR =1.25, 95% CI=1.07-1.46). The association of vitamin B₃ with periodontitis was stronger in females and participants aged 40-59 years.

Conclusions: Inadequate dietary intake of vitamin B₃ was associated with periodontitis.

Key words: Thiamine (vitamin B₁), Riboflavin (vitamin B₂),
Niacin (vitamin B₃), Epidemiology, Gingivitis, Periodontitis.

Student No: 2011-31197

Table of Contents

1. Introduction	1
1-1. Background	
1-2. Hypothesis and Objectives	
2. Material & Methods	3
2-1. Study design and participant selection	
2-2. Assessment of periodontal status	
2-3. Assessment of dietary intake of vitamin A, B ₁ , B ₂ , B ₃ and C	
2-4. Assessment of potential confounders	
2-5. Statistical analysis	
3. Results	10
3-1. Characteristics of the participants according to periodontal status	
3-2. Association of dietary intake of vitamin B ₁ , B ₂ , B ₃ with gingivitis	
3-3. Association of dietary intake of vitamin B ₁ , B ₂ , B ₃ with periodontitis	
3-4. Stratified association by age, sex, dyslipidemia & total energy intake	
4. Discussion	12
5. Conclusion	16
Tables and figures	17
References	27
Abstract in Korean	32
Appendix	35

Table list

- Table 1. Characteristics of the participants according to periodontal status
- Table 2. Adjusted associations of dietary vitamin B₁, B₂, and B₃ intake (by EAR) with gingivitis (CPI 1-2) by multi-variable logistic regression analysis (N=8543)
- Table 3. Adjusted associations of dietary vitamin B₁, B₂, and B₃ intake (by EAR) with periodontitis (CPI 3-4) by multi-variable logistic regression analysis (N=6959)
- Table 4. Stratified association of age and sex, dyslipidemia and total energy intake of dietary vitamin B₃ intake with periodontitis (CPI 3-4) (by EAR) (N=6959)

Figure list

- Figure 1. Flow chart of the participants for this study
- Figure 2. Association between vitamin B₁, B₂, and B₃ in quartile and periodontal status

Appendix list

- Appendix 1. Raw data by SPSS statistics
- 1-1. Raw data by SPSS statistics for Table 1
 - 1-2. Raw data by SPSS statistics for Table 2
 - 1-3. Raw data by SPSS statistics for Table 3
 - 1-4. Raw data by SPSS statistics for Table 4
 - 1-5. Raw data by SPSS statistics for Figure 2
- Appendix 2. Strengthening the Reporting of Observational studies (STROBE) in Epidemiology guideline

1. Introduction

1-1. Background

Periodontal diseases are highly prevalent ¹. The prevalence of ‘mild’ to ‘severe’ periodontitis in 2009-2012 among U.S. adults aged over 30 years was 46% ². There could be many inflammatory conditions affecting periodontal disease. Risk factors include oral bacteria ³, metabolic syndrome ⁴, obesity ⁵, diabetes ⁶, hypertension ⁷, smoking ⁸, drinking ⁹, financial strain ¹⁰, specific genes ¹¹, mercury exposure ¹², tooth brushing and proximal cleaning ¹³.

Nutrition factors are linked in oral, systemic disease and conditions ¹⁴. Diet could play an important role in oral health and might be modifying factor in the process of periodontal disease ¹⁵. Diet quality and nutrition had close association with tooth loss ^{16,17}. Some study noted that as people lose teeth, there was a trend toward the presence of a poorer diet ¹⁸. Malnutrition and diet quality could be predisposing factor to the progression of periodontal lesions. Inadequate vitamin C (Ascorbic acid) intake was associated with periodontitis ¹⁹.

Vitamin B-complex could be important to wound healing in periodontal tissue among all the nutrients needed for physiological function ²⁰ and Vitamin B-complex supplementation could restore clinical attachment levels (CAL) gains with flap surgery ²¹. Vitamin B₃ (niacin) was first described as a lipid modulator in 1955 ²². Since then, vitamin B₃ supplementation has been used for the pharmacologic treatment of lipid disorders ²³. Vitamin B₃-deficient stomatitis including gingivitis and

periodontitis was reported in niacin deficient marmosets for the first time ²⁴. Some study noted that nicotinate paste could reduce the inflammation of gingiva in monkey study ²⁵. The serum level of vitamin B9 (folate) ²⁶ and vitamin B12 (Cobalamin) ²⁷ of vitamin B-complex were significantly associated with periodontal disease.

1-2. Hypothesis and Objectives

The previous vitamin B-complex studies had some limitations: rare, small samples, the lack of adjustment and methodological rigorousness. Furthermore, the association of individual vitamin B₁, B₂, and B₃ with periodontal disease were not well investigated. Thus, more evidences on the association between dietary intake of vitamin B₁, B₂, and B₃ and periodontal health are needed. Studies with sufficient sample size and adjustment for various potential confounders are indicated to confirm the link. Hence, we made a hypothesis that inadequate intake of vitamin B₁, B₂, and B₃ is associated with periodontal health among adults. Thus, this study aims to evaluate the association between vitamin B₁, B₂, and B₃ and periodontal diseases encompassing gingivitis and periodontitis, and the stratified association by age, sex, dyslipidemia and total energy intake after controlling for various potential confounders among the nationally representative Korean adults.

2. Materials and Methods

2-1. Study design and participant selection

This study used data-sets from the fourth and fifth Korean National Health and Nutrition Examination Survey (KNHANES IV and V, 2007 to 2012) ²⁸. This survey has been conducted as every year continuous survey from 2007. The multi-stage, stratified, clustered, rolling survey, and complex sampling methods were designed to involve independent and equal properties. The primary sample units (PSUs) were selected from a sampling frame based on the household registries survey data. Approximately, 20 households from each of 576 PSUs were selected. This cross-sectional data-set includes information on the general health, oral health and nutritional status of the non-institutionalized civilian population in Korea.

We combined the continuous five-year KNHANES data (KNHANES IV and V) in order to generate data sets that are more representative. However, the year 2011 data was excluded in this study due to the lack of precise periodontal examination. The inclusion criteria for this study were: (1) adult aged 19 years and over; (2) those dentate who underwent a periodontal examination; (3) those with essential nutrients intake information of vitamin A, B₁, B₂, B₃, and C, and total energy intake; (4) those with potential confounding variables. Out of total 41,887 participants in year 2007-2012, the 31,439 participants (75.1% of the total) were older than 19 years of age. Out of the 31,439

participants, the 27,978 participants (66.8% of the total) had a valid periodontal examination. Out of the 27,978 participants, the 24,342 (58.1% of the total) participants had valid nutrition data. Out of the 24,342 participants, the 12,750 participants (30.4% of the total) who had information about potential confounding variables were included for the final analysis (Fig. 1). This study used the Strengthening the Reporting of Observational studies in Epidemiology guideline ²⁹ (Appendix 2).

2-2. Assessment of periodontal status

The outcome variable is periodontal health. Trained dentists examined the periodontal status of the participants using Community Periodontal Index (CPI) according to the World Health Organization guideline ³⁰. The CPI scores are as follows: CPI 0= normal health gingiva, CPI 1= gingival bleeding on probing, CPI 2= presence of calculus, CPI 3= pocket depth of 3.5-5.5mm, CPI 4= pocket depth of 5.5mm or more. The WHO guideline categorized periodontal status into three groups: healthy (CPI 0), gingivitis (CPI 1-2) and periodontitis (CPI 3-4). Ten index teeth were selected for the periodontal examination: two molars in each posterior sextant and the upper right and lower left central incisors. If the index tooth was absent in a sextant qualifying for examination, the adjacent remaining tooth in that sextant was examined. The measurements of CPI using a CPI probe were made at six sites (mesio-buccal,

mid-buccal, disto-buccal, disto-lingual, mid-lingual, and mesio-lingual) per tooth with nearly 20g probing force. The highest score for teeth was recorded as the CPI score. The mean of Kappa values for inter-examiner reliability were from 0.70 to 0.93 ³¹⁻³⁵.

2-3. Assessment of dietary intake of vitamin A, B₁, B₂, B₃ and C

The intakes of dietary vitamin A, B₁, B₂, B₃ and C intakes were evaluated using the 24-hour dietary recall method by food frequency questionnaire (FFQ) through direct interview. This method has been widely used in nutrition epidemiology to estimate the mean intakes for groups ³⁶. The daily total energy intakes (or total energy expenditure) were classified into above and below by the cut-off using Estimated Energy Requirement (EER) in Korea. The EER was calculated by the prediction equation ³⁷ of doubly labeled water suggested in Korean Dietary Reference Intakes 2015 ³⁸. Daily dietary food intake was calculated as estimates of the daily nutrient intakes by using the food nutrient composition database and calculation formula conducted by Korea Centers for Disease Control and Prevention (KCDCP) ³⁹.

In this study, individual vitamin B₁, B₂ and B₃ are main explanatory variables. The continuous dietary intake of vitamin B₁, B₂ and B₃ was categorized using two ways of categorization for sensitive analysis: Firstly, we categorized the continuous dietary intake of vitamin B₁, B₂, and B₃ into quartile: lowest (Q1), middle lower (Q2), middle upper

(Q3), highest (Q4). Secondly, the continuous dietary intake value of vitamin B₁, B₂, and B₃ was categorized into three groups using the Korean Estimated Average Requirement (KEAR) according to the cut-off point of Dietary Reference Intake (DRI)³⁸ for the clinical considerations. The three groups were adequate intake, inadequate intake, and over tolerable upper intake. The EAR is defined as the average daily nutrient intake to meet the nutrient requirements of half of the population, which is commonly used in assessing nutrient adequacy of the population groups⁴⁰. According to the EAR, we can determine whether their intake of the nutrients is adequate⁴¹. The over tolerable upper intake level (UL) is defined as an estimate level at which adverse health risk could appear. The UL of vitamin A, B₃, and C have is 3000 μ g/day for vitamin A, 35mg/day for vitamin B₃, and 2000mg/day for vitamin C respectively according to the DRI³⁸.

2-4. Assessment of potential confounders

Many various potential confounders such as age, sex, income, behaviors and systemic health have been reported on the association between periodontal status and nutrients intake^{42,43}. Intakes of nutrients were associated with social status, economic status, physical exercise, life style and obesity^{44,45}. Thus, we selected five groups of potential confounders, a priori: socio-demographic factors (age, sex, and household income), oral health-related behavior (tooth brushing),

and general health-related behaviors (physical activity, alcohol drinking, cigarette smoking), nutrition factors (vitamin A, vitamin C), total energy intake, and systemic disease factors (diabetes, hypercholesterolemia, dyslipidemia, hypertension, and obesity). The information was acquired from standardized questionnaires applied by trained interviewers, the information about diabetes, hypercholesterolemia, and hypertension were from laboratory tests, and obesity was from physical measurements by nurses. We used age as a continuous variable for adjusted analysis. For subgroup analysis, we categorized age into three age groups: 19 to 39, 40 to 59, and 60 and over. The monthly household income adjusted for the number in the family was categorized into quartile. The frequency of tooth brushing/day was categorized into three: once or no, twice, and thrice or more/day. Physical activity was based on walking exercise of at least 30 minutes/day, was categorized into three: no exercise, 1 to 4 times/week, and 5 to 7 times/week. Alcohol drinking was categorized into four groups: 0 to 1 times/month, 2 to 4 times /month, 2 to 3 times/week, and over 4 times/week. Cigarette smoking was categorized into three: non-smokers, former smokers, and current smokers.

Diabetes mellitus (DM) was classified into three groups according to the diagnostic criteria of American Diabetes Association ⁴⁶. DM was defined as having fasting plasma glucose (FPG) ≥ 126 mg/dl or on anti-diabetic medication, Pre-diabetes (impaired fasting glucose, IFG); $100 \leq$ FPG ≤ 125 mg/dl, and the Normal; FPG < 100 mg/dl. Hypercholesterolemia

was defined as fasting total cholesterol (FTC) ≥ 240 mg/dl, or on anti-cholesterol medication, normal status: FTC < 240 mg/dl, according to the criteria of National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP III). Dyslipidemia was defined as one or more of the follows: Low Density Lipoprotein Cholesterolemia; (LDL-C ≥ 160 mg/dL), triglyceridemia (TG ≥ 200 mg/dL), High Density Lipoprotein Cholesterolemia (HDL-C < 40 mg/dL). Hypertension was defined as having either systolic blood pressure (SBP) ≥ 140 mmHg or diastolic blood pressure (DBP) ≥ 90 mmHg, or on anti-hypertensive medication, Pre-hypertension stage; $120 \leq$ SBP < 140 mmHg or $80 \leq$ DBP < 90 mmHg, and Normal blood pressure; SBP < 120 mmHg and DBP < 80 mmHg. It was based on blood pressure cut-off points suggested by the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure report ⁴⁷. Obesity was defined by the body mass index (BMI) which was calculated as weight (kg) divided by the square of height in meters (kg/m^2). Those underweight had a BMI < 18.5 kg/m^2 , normal: ≥ 18.5 kg/m^2 , but < 25 kg/m^2 , and obesity: ≥ 25.0 kg/m^2 as suggested by the WHO ⁴⁸.

2-5. Statistical analysis

The KNHANES IV and V data used a complex sampling design with stratification, clustering and unequal weighting. Thus, all statistical analyses accounted for the complex sample design, and individual

weighted factors. The outcome variables were the prevalence odds of gingivitis and periodontitis, and the main explanatory variables were dietary vitamin B₁, B₂, and B₃ intake. The Rao-Scott chi-square test was performed to compare the characteristics of participants and dietary vitamin B₁, B₂, and B₃ intake by periodontal status. Multivariable logistic regression analysis considering complex sample design of KNHANES was carried out to evaluate the adjusted association. The adjusted odds ratios (adjusted ORs) and 95% confidence interval (CI) of dietary vitamin B₁, B₂, and B₃ for gingivitis and periodontitis were estimated after adjusting for potential confounders. Our data showed that vitamin B₁, B₂, and B₃ were highly correlated: the correlation coefficient was 0.73 for vitamin B₁ versus vitamin B₂, 0.75 for vitamin B₁ versus vitamin B₃, and 0.72 for vitamin B₂ versus vitamin B₃. Because of high collinearity among vitamin B₁, B₂ and B₃, we decided to undertake the separate analyses of vitamin B₁, B₂, and B₃. Moreover, the association between the quartile of vitamin B₁, B₂, and B₃ and periodontitis were also evaluated. There might be some variance between vitamins and periodontitis according to age and sex¹⁹. Thus, we performed the stratified analyses according to age group and sex to find out more risky group and to reduce big-sample bias according to the sampling strategy of KNHANES IV and V.

Moreover, we additionally performed stratified analyses according to total energy intake and dyslipidemia, since total energy intake and

dyslipidemia could modify the association between vitamin B₁, B₂, B₃ and periodontal status. SPSS statistical package version 24 (SPSS: IBM corporation, Armonk, NY, USA) was used for all statistical analyses.

3. Results

3-1. Characteristics of the participants according to periodontal status

Among 12,750 participants, the weighted prevalence of gingivitis was 46.6% (95% CI, 45.1-48.2) and that of periodontitis was 29.9% (95% CI, 28.6-31.3) respectively (Table 1). Among 11,592 non-participants excluded due to the lack of information about potential confounders, the prevalence of gingivitis and periodontitis was 48.2% (95% CI, 46.6-49.9) and 26.7% (95% CI, 25.2-28.2) respectively. The proportion of healthy group had higher proportion in females, high income, three times or more tooth brushing per day, more physical activity, the least alcohol drinkers, non-smokers, and normal systemic conditions.

3-2. Association of dietary intake of vitamin B₁, B₂, and B₃ with gingivitis

Only vitamin B₂ by quartile was significantly associated with gingivitis (adjusted OR=1.46, 95% CI=1.21-1.78) (Fig. 2). None of the inadequate intake vitamin B₁, B₂, and B₃ by EAR showed significant association with gingivitis in adjusted odds ratios after controlling for potential confounders such as nutrition factors, socio-demographic

factors, oral and general health-related behaviors, and systemic condition factors (Table 2). The association were crude OR (95% CI) of 1.13 (1.01-1.26) and adjusted OR (95% CI) of 1.12 (0.99-1.27) for vitamin B₁, crude OR (95% CI) of 1.18 (1.06-1.32) and adjusted OR (95% CI) of 1.08 (0.95-1.22) for vitamin B₂, and crude OR (95% CI) of 1.13 (1.0-1.28) and adjusted OR (95% CI) of 1.12 (0.97-1.29) for vitamin B₃. The binge drinkers (over 4 times/week) showed higher prevalence odds by 1.4 times than non-drinkers after adjustment.

3-3. Association of dietary intake of vitamin B₁, B₂, and B₃ with periodontitis

Both vitamin B₂ and B₃ by quartile were significantly associated with periodontitis (adjusted OR=1.52, 95% CI=1.20-1.93 for vitamin B₂ and adjusted OR=1.38, 95% CI=1.10-1.74 for vitamin B₃) (Fig. 2). Only inadequate intake of vitamin B₃ by EAR showed significant association with periodontitis in crude and adjusted analyses (Table 3): crude OR (95% CI) of 1.28 (1.13-1.45) and adjusted OR (95% CI) of 1.25 (1.07-1.46). For vitamin B₁, crude and adjusted ORs (95% CI) were 1.26 (1.12-1.42) and 1.13 (0.98-1.32) respectively. For vitamin B₂, crude and adjusted ORs (95% CI) were 1.52 (1.34-1.72) and 1.11 (0.95-1.29) respectively. The binge drinkers (over four times per week), current smokers, those with diabetes and those with obesity showed higher prevalence odds of periodontitis by 1.9 times, 1.6

times, 1.6 times and 1.2 times than non-drinkers, non-smokers, those without diabetes, and those without obesity respectively.

3-4. Stratified association by age, sex, dyslipidemia and total energy intake by EAR

In the stratified analysis, the association of vitamin B₃ by EAR with periodontitis was stronger in participants aged 40-59 years (adjusted OR=1.59, 95% CI=1.23-2.06) and female (Table 4). The subjects without dyslipidemia were also significant with periodontitis (adjusted OR=1.25, 95% CI=1.07-1.48).

4. Discussion

Our results suggest that inadequate dietary intake of vitamin B₃ could be a risk factor for periodontitis. The association was stronger in female, participants aged 40 to 59 years. To the best of our knowledge, our results are the first evidence from nationally representative adults that accept the hypothesis that inadequate intake of vitamin B₃ was associated with periodontitis.

The main strengths of this study are as follows. Firstly, to our knowledge, this is the first cross-sectional study on the associations between individual vitamin B₁, B₂, B₃ and periodontal disease with nation-wide and representative sample. Secondly, we estimated dietary vitamin B₁, B₂, and B₃ intake by two ways (Quartile and EAR) for

sensitivity analyses. Thirdly, the associations were adjusted for various potential confounders. Finally, our results might be used in periodontal disease patients to improve periodontal status.

Our data showed that the associations between intake of vitamin B₃ and periodontitis were stronger in females and participants aged 40 to 59 years. This was likely due to the facts that females were less likely to smoke or consume alcohol than males ⁴³, and they might have less periodontitis. In addition, middle-aged adults have moderate prevalence of periodontitis across age, which could be appropriate age group to show the association of intake of vitamin B₃ with periodontitis. Especially, the association was significant in those with no dyslipidemia, since inadequate intake of vitamin B₃ could aggravate lipid disorders ⁴⁹. Moreover, vitamin B₂ by the quartile was associated with both gingivitis and periodontitis even though it was not associated by EAR. The association between vitamin B₂ and gingivitis and periodontitis was significant at lowest quartile. Hence, further studies are indicated to clarify these findings.

Our finding was that inadequate intake of vitamin B₃ was significantly associated with periodontitis. Vitamin B₃ is an effective drug for lipid disorders such as cardiovascular disease, coronary heart disease, metabolic syndrome, and dyslipidemia, which are all closely associated with periodontitis ^{49,50}. Moreover, there could be any conditions whereby vitamin B₃ (or any of the other vitamin A/B/C)

are not absorbed thus leading to lower levels for those with liver dysfunction. Hyper-lipidemia could impair immune response to periodontal pathogen infection (*Porphyromonas gingivalis*)⁵¹. Lipid regulating genes were strongly related with periodontitis¹¹. Therefore, controlling lipid disorders could be an important factor for the management of periodontitis⁵². The statins that were used in lipid-lowering therapies were associated with protecting from tooth loss⁵³. Thus, these previous evidences confirmed our findings. It could be important to eat adequate niacin intake by taking vitamin B₃-rich foods such as meat, fish, milk, green vegetables, and cereal grains regularly⁵⁴. When niacin is used to treat high blood cholesterol levels, 500-1,000 mg extended-release nicotinic acid is provided⁵⁵. However, when taken in over-dose of 1000 mg/day as pharmacologic use, niacin can cause serious adverse effect⁵⁶. Thus, to determine effective dose to periodontal treatment, well designed prospective experimental study is needed.

The deleterious action of vitamin B₃-deficiency on periodontitis could be addressed possibly as follows: firstly, hyper-lipidemia increases pro-inflammatory cytokines secretion such as tumor necrosis factor-alpha (TNF- α) and interleukin-1 beta (IL-1 β)⁵². Vitamin B₃ deficiency mediates inflammatory effect by non-regulating lipid⁵⁷. Secondly, oxidative stress is thought to be linked in inflammatory disease and closely involved in the development of periodontitis⁵⁸. The anti-oxidative property of vitamin

B₃ could be beneficial to the prevention of periodontitis. Lastly, vitamin B₃ deficiency could cause cell injury⁵⁹ and delay DNA repair⁶⁰.

There are several limitations to this study. Firstly, this cross-sectional study prevented us from inferring causality between dietary niacin intake and periodontitis. Secondly, the KNHANES (2007 to 2012) derived nutrient intake data by 24-hour recall method. However, 24-hour recall method has some limitations due to lack of representation of the habitual dietary pattern of individual¹⁶. Thirdly, those with any missing variables data were excluded, which might involve selection bias. However, the prevalence of periodontitis among the non-participants was similar to that of participants. Finally, the CPI evaluation have the possibility of underestimation⁴ in assessing since this is a partial mouth examination, old subjects have tendency to have gingival recession with low pockets and over estimation in deep pocket of edematous gingiva. However, CPI has been accepted as an evaluating tool for periodontal health in epidemiological study. Finally, well-designed longitudinal further studies are required to infer causality. Notwithstanding these limitations, this nationally representative epidemiological study was valid enough to test the hypothesis that inadequate vitamin B₃ intake was associated with periodontitis.

5. Conclusion

Our data support that inadequate intake of dietary vitamin B₃ was associated with periodontitis and could be an independent risk factor for periodontitis.

Table 1. Characteristics of the participants according to periodontal status (N=12750)

Variables	Category	Total N	Periodontal status						<i>p-value</i> ^b
			Healthy (CPI 0)		Gingivitis (CPI 1-2)		Periodontitis (CPI 3-4)		
			N	% (95%CI) ^a	N	% (95%CI)	N	% (95%CI)	
Total		12750	2752	100.0	5791	100.0	4207	100.0	
Age,	Mean ±SD ^c	12750		41.37±14.60		43.98±14.89		54.05±13.35	<0.001
Sex	Male	5673	913	42.3 (39.9-44.7)	2390	52.7 (51.3-54.2)	2370	64.9 (63.3-66.5)	<0.001
	Female	7077	1839	57.7 (55.3-60.1)	3401	47.3 (45.8-48.7)	1837	35.1 (33.5-36.7)	
Monthly household income									<0.001
	Low	2094	291	9.2 (7.8-10.8)	830	11.2 (10.0-12.5)	973	16.7 (15.2-18.4)	
	Middle-low	3070	561	21.4 (19.3-23.7)	1396	23.8 (22.2-25.5)	1113	26.3 (24.5-28.3)	
	Middle-high	3647	846	30.4 (28.2-32.6)	1692	30.8 (29.1-32.6)	1109	29.8 (27.9-31.7)	
	High	3939	1054	39.1 (36.3-42.0)	1873	24.1 (32.0-36.4)	1012	27.2 (25.0-29.5)	
Tooth brushing frequency per day									<0.001
	Once or no	1482	200	6.6 (5.5-7.9)	619	9.5 (8.7-10.5)	663	14.2 (13.0-15.6)	
	Twice	5292	968	35.1 (33.0-37.3)	2396	40.7 (39.1-42.4)	1928	45.6 (43.8-47.4)	
	Three times or more	5976	1584	58.3 (55.9-60.6)	2776	49.7 (48.0-51.5)	1616	40.2 (38.3-42.1)	
Physical activity (walking) ^d									0.002
	No	1489	279	9.4 (8.2-10.8)	700	11.0 (10.0-12.2)	510	12.0 (10.8-13.3)	
	1-4/week	4546	1038	36.6 (34.4-38.8)	2084	36.5 (35.1-38.0)	1424	37.0 (35.2-38.8)	
	5-7/week	6715	1435	54.0 (51.6-56.4)	3007	52.4 (50.7-54.1)	2273	51.0 (49.1-52.9)	
Alcohol drinking (past one year)									<0.001
	0-1/month	6511	1501	48.6 (46.1-51.1)	2979	46.1 (44.5-47.7)	2031	42.4 (40.6-44.2)	
	2-4/month	3227	775	31.5 (29.4-33.6)	1518	29.4 (28.0-30.9)	934	24.5 (22.9-26.1)	
	2-3/week	1990	378	16.4 (14.7-18.4)	897	18.0 (16.8-19.3)	715	20.1 (18.6-21.8)	
	≥ 4/week	1022	98	3.5 (2.8-4.4)	397	6.5 (5.7-7.3)	527	13.0 (11.8-14.3)	
Cigarette smoking									<0.001
	Non-smoker	7215	1857	60.3 (57.9-62.6)	3453	51.7 (50.1-53.3)	1905	37.4 (35.7-39.1)	
	Former smoker	354	92	4.2 (3.4-5.3)	178	3.7 (3.1-4.3)	84	2.1 (1.6-2.7)	
	Current smoker	5181	803	35.5 (33.2-37.8)	2160	44.6 (43.1-46.2)	2218	60.5 (58.7-62.3)	
Diabetes ^e									<0.001
	Normal	9331	2261	83.9 (82.1-85.5)	4446	79.4 (78.0-80.7)	2624	64.4 (62.5-66.2)	
	Pre-diabetes	2346	370	12.8 (11.3-14.4)	953	15.4 (14.2-16.6)	1023	23.4 (21.8-25.1)	
	Diabetic	1073	121	3.4 (2.8-4.1)	392	5.3 (4.6-6.0)	560	12.2 (11.0-13.4)	
Hypercholesterolemia									<0.001
	no	11416	2531	93.2 (91.9-94.3)	5241	91.8 (90.9-92.6)	3644	87.8 (86.6-88.8)	
	yes	1334	221	6.8 (5.7-8.1)	550	8.2 (7.4-9.1)	563	12.2 (11.2-13.4)	
Dyslipidemia ^f									<0.001
	No	11798	2577	95.2 (94.3-96.0)	5412	94.5 (93.8-95.2)	3809	91.0 (89.9-92.1)	

	Yes	952	175	4.8 (4.0-5.7)	379	5.5 (4.8-6.2)	398	9.0 (7.9-10.1)	
Hypertension ^g									<0.001
	Normal	6274	1679	62.1 (59.7-64.5)	3051	54.2 (52.3-56.1)	1544	39.4 (37.3-41.4)	
	Pre-HP	3109	596	22.8 (20.9-24.8)	1393	26.0 (24.4-27.6)	1120	27.3 (25.6-29.1)	
	Hypertension	3367	477	15.0 (13.5-16.7)	1347	19.8 (18.5-21.2)	1543	33.3 (31.4-35.4)	
Obesity ^h	Normal	8268	1907	68.0 (65.9-70.0)	3778	64.6 (63.1-66.1)	2583	60.1 (58.2-62.0)	<0.001
	Under-weight	597	178	7.0 (5.9-8.2)	283	4.9 (4.3-5.6)	136	3.2 (2.7-4.0)	
	Obesity	3885	667	25.0 (23.1-27.1)	1730	30.5 (29.0-32.0)	1488	36.6 (34.8-38.5)	
Total energy intake per day									0.139
	Over EER ⁱ	4464	974	35.7 (33.6-38.0)	1976	34.9 (33.4-36.4)	1514	37.2 (35.3-39.2)	
	Less EER	8286	1778	64.3 (62.0-66.4)	3815	65.1 (63.6-66.6)	2693	62.8 (60.8-64.7)	
Vitamin A by EAR ^j									<0.001
	Adequate	7279	1662	61.0 (58.8-63.1)	3358	58.7 (57.0-60.3)	2259	55.8 (53.8-57.7)	
	Inadequate	5154	1012	36.4 (34.3-38.6)	2309	39.1 (37.4-40.7)	1833	41.7 (39.7-43.6)	
	Over UL ^k	317	78	2.6 (2.0-3.4)	124	2.3 (1.8-2.8)	115	2.6 (2.0-3.2)	
Vitamin C by EAR ^l									<0.001
	Adequate	7025	1625	58.8 (56.4-61.1)	3172	55.5 (53.7-57.2)	2228	55.5 (53.5-57.5)	
	Inadequate	5724	1126	41.2 (38.9-43.6)	2619	44.5 (42.8-46.3)	1979	44.5 (42.5-46.5)	
	Over UL	1	1	0.0 (0.0-0.2)					
Vitamin B ₁ by EAR ^m									<0.001
	Adequate	7909	1822	68.4 (66.3-70.4)	3598	65.8 (64.3-67.3)	2489	63.3 (61.5-65.0)	
	Inadequate	4841	930	31.6 (29.6-33.7)	2193	34.2 (32.7-35.7)	1718	36.7 (35.0-38.5)	
Vitamin B ₁ Quartile ⁿ									<0.001
	Lowest Q1	3187	597	19.3 (17.7-21.0)	1443	21.6 (20.2-23.0)	1147	23.4 (21.9-25.1)	
	Middle-lower Q2	3188	727	25.2 (23.4-27.2)	1431	23.3 (22.0-24.6)	1030	23.1 (21.6-24.6)	
	Middle-upper Q3	3188	714	26.7 (24.7-28.7)	1430	25.0 (23.7-26.4)	1044	26.0 (24.4-27.7)	
	Highest Q4	3187	714	28.8 (26.7-31.0)	1487	30.1 (28.7-31.6)	986	27.5 (25.8-29.3)	
Vitamin B ₂ by EAR ^o									<0.001
	Adequate	5549	1377	51.6 (49.3-53.9)	2614	47.5 (45.8-49.2)	1558	41.2 (39.2-43.3)	
	Inadequate	7201	1375	48.4 (46.1-50.7)	3177	52.5 (50.8-54.2)	2649	58.8 (56.7-60.8)	
Vitamin B ₂ Quartile ^p									<0.001
	Lowest Q1	3187	547	17.1 (15.6-18.8)	1415	21.2 (19.9-22.6)	1225	24.0 (22.4-25.6)	
	Middle-lower Q2	3188	703	25.0 (23.1-26.9)	1421	23.0 (21.7-24.3)	1064	24.0 (22.6-25.5)	
	Middle-upper Q3	3188	720	26.4 (24.5-28.3)	1506	27.2 (25.8-28.7)	962	25.2 (23.6-26.7)	
	Highest Q4	3187	782	31.6 (29.5-33.7)	1449	28.6 (27.1-30.1)	956	26.8 (25.1-28.7)	
Vitamin B ₃ by EAR ^q									<0.001
	Adequate	7985	1821	68.1 (65.9-70.1)	3644	65.4 (63.8-66.9)	2520	63.4 (61.6-65.2)	
	Inadequate	4285	825	27.2 (25.2-29.3)	1918	29.5 (28.1-31.0)	1542	32.5 (30.8-34.3)	

	Over UL	480	106	4.7 (3.9-5.8)	229	5.1 (4.4-5.9)	145	4.1 (3.3-5.0)	
Vitamin B ₃ Quartile ^r									0.02
	Lowest Q1	3187	631	20.2 (18.5-21.9)	1439	21.2 (19.9-22.6)	1117	22.6 (21.1-24.2)	
	Middle-lower Q2	3188	703	24.0 (22.2-26.0)	1431	23.2 (21.9-24.5)	1054	23.0 (21.4-24.6)	
	Middle-upper Q3	3188	686	25.0 (23.2-26.9)	1471	26.2 (24.8-27.5)	1031	26.1 (24.6-27.7)	
	Highest Q4	3187	732	30.8 (28.5-33.2)	1450	29.4 (28.0-30.9)	1005	28.3 (26.5-30.2)	

^a % (95% CI): Weighted percentage by column (95% Confidence Interval).

^b *P-value*: obtained from Chi-Square test for categorical variables and from ANOVA-test for continuous variables.

^c Mean \pm SD: Mean \pm Standard Deviation.

^d Physical activity: walking at least 30 minutes per week.

^e Diabetes: Normal FPG (fasting plasma glucose) <100mg/dl, Pre-diabetes 100≤FPG≤125mg/dl, Diabetes FPG ≥126mg/dl, or on anti-diabetic medication.

^f Dyslipidemia: No: Low-Density Lipoprotein Cholesterol (LDL-C) <160mg/dL, Triglyceride Cholesterol (TG-C) <200mg/dL
High Density Lipoprotein Cholesterol (HDL-C) ≥40mg/dL.
Yes: LDL-C≥ 160mg/dL, TG-C≥200mg/dL, HDL-C<40mg/dL.

^g Hypertension: Normal: Systolic Blood Pressure (SBP) <120mmHg and Diastolic Blood Pressure (DBP) <80mmHg,
Pre-hypertension (Pre-HP): 120≤ SBP<140mmHg or 80≤ DBP <90mmHg,
Hypertension (HP): 140mmHg ≤ SBP, or 90mmHg≤DBP, or on anti-hypertensive medication

^h Obesity: Normal: 18.5 kg/m² ≤ Body Mass Index (BMI) <25kg/m², Under-weight: BMI <18.5kg/m², Obesity: 25kg/m² ≤BMI.

ⁱ Estimated Energy Requirement: Male: 19-29age 2600 kcal/day, 30-49age 2400kcal/day, 50-64age 2,200kcal/day, over 65age 2,000kcal/day, Female: 19-29age 2,100 kcal/day, 30-49age 1,900kcal/day, 50-64age 1,800kcal/day, over 65age 1,600kcal/day.

^j Vitamin A by EAR: Adequate intake: 550μg/day ≤intake<2999μg/day for male; Inadequate: intake <549μg/day; over UL: intake ≥3000μg/day.

^k Over tolerable upper intake level.

^l Vitamin C by EAR: Adequate intake: 75mg≤intake<1999mg/day; Inadequate: intake <75mg/day; over UL: intake ≥2000mg/day.

^m Vitamin B₁ by EAR: Adequate intake: 1mg /day≤ intake for male, 0.9mg/day≤ intake for female; Inadequate intake: intake<1mg/day for male, <0.9mg/day for female.

ⁿ Vitamin B₁ Quartile: Q1; ≤0.77 mg/day, Q2; 0.78 -1.09 mg/day, Q3; 1.10 -1.54 mg/day, Q4; ≥ 1.55 mg/day.

^o Vitamin B₂ by EAR: Adequate intake: 1.30mg/day≤ intake for male, 1.00mg/day≤ intake for female; Inadequate intake: intake<1.30 mg/day for male, intake<1.00 mg/day for female

^p Vitamin B₂ Quartile: Q1; ≤0.68 mg/day, Q2; 0.69 -1.01 mg/day, Q3; 1.02 -1.46 mg/day, Q4; ≥ 1.47 mg/day.

^q Vitamin B₃ by EAR: Adequate intake: 12mg≤intake<35mg/day for male, 11mg≤intake<35mg/day for female; Inadequate: intake <12mg/day for male, <11mg/day for female; Over UL: intake ≥ 35 mg/day.

^r Vitamin B₃ Quartile: Q1; ≤10.05 mg/day, Q2; 10.06 -14.07 mg/day, Q3;14.08-19.72 mg/day, Q4; ≥ 19.73 mg/day.

Table 2. Adjusted associations of dietary vitamin B₁, B₂, B₃ intake (by EAR) with gingivitis (CPI 1-2) by multi-variable logistic regression analysis (N=8543)

Variables	Category	N	Crude odds ratios (95%CI)	Adjusted odds ratios ^a (95%CI)		
				Vitamin B ₁	Vitamin B ₂	Vitamin B ₃
Vitamin B ₁	Adequate	5420	1	1		
	Inadequate	3123	1.13 (1.01-1.26)	1.12 (0.99-1.27)		
Vitamin B ₂	Adequate	3991	1		1	
	Inadequate	4552	1.18 (1.06-1.32)		1.08 (0.95-1.22)	
Vitamin B ₃	Adequate	5465	1			1
	Inadequate	2743	1.13 (1.00-1.28)			1.12 (0.98-1.29)
	Over UL ^b	335	1.12 (0.86-1.46)			1.02 (0.77-1.36)
Vitamin A	Adequate	5020	1	1	1	1
	Inadequate	3321	1.12 (0.99-1.25)	1.02 (0.90-1.16)	1.02 (0.90-1.17)	1.03 (0.91-1.17)
	Over UL	202	0.90 (0.63-1.27)	0.89 (0.63-1.28)	0.91 (0.64-1.29)	0.90 (0.63-1.27)
Vitamin C	Adequate	4797	1	1	1	1
	Inadequate	3745	1.14 (1.02-1.28)	1.11 (0.97-1.26)	1.13 (0.99-1.28)	1.12 (0.98-1.27)
	Over UL	1				
Age (continuous)		8543	1.01 (1.01-1.01)	1.00 (0.99-1.01)	1.00 (0.99-1.01)	1.00 (0.99-1.01)
Sex	Male	3303	1	1	1	1
	Female	5240	0.66 (0.59-0.74)	0.75 (0.64-0.88)	0.76 (0.65-0.89)	0.75 (0.64-0.88)
Monthly household income						
	Low	1121	1	1	1	1
	Middle-low	1957	0.91 (0.72-1.15)	0.99 (0.79-1.27)	0.99 (0.78-1.26)	0.99 (0.79-1.27)
	Middle-high	2538	0.83 (0.67-1.03)	0.96 (0.76-1.20)	0.96 (0.76-1.20)	0.96 (0.77-1.20)
	High	2927	0.72 (0.57-0.90)	0.84 (0.66-1.07)	0.84 (0.66-1.07)	0.85 (0.66-1.08)
Tooth brushing frequency (daily)						
	Once or no	819	1	1	1	1
	Twice	3364	0.81 (0.64-1.01)	0.92 (0.73-1.16)	0.92 (0.73-1.16)	0.92 (0.73-1.16)
	Three times or more	4360	0.59 (0.47-0.75)	0.74 (0.58-0.93)	0.74 (0.58-0.93)	0.74 (0.58-0.94)
Physical activity (walking)						
	No	979	1	1	1	1

	1-4 /week	3122	0.86 (0.71-1.03)	0.93 (0.77-1.12)	0.92 (0.76-1.12)	0.93 (0.77-1.12)
	5-7 /week	4442	0.83 (0.69-0.99)	0.88 (0.73-1.06)	0.88 (0.73-1.06)	0.88 (0.73-1.06)
Alcohol drinking (past one year)						
	0-1 /Month	4480	1	1	1	1
	2-4 /Month	2293	0.99 (0.87-1.12)	0.93 (0.82-1.06)	0.93 (0.82-1.06)	0.94 (0.82-1.07)
	2-3/Week	1275	1.16 (0.98-1.37)	0.97 (0.81-1.17)	0.97 (0.81-1.17)	0.98 (0.81-1.17)
	Over 4/Week	495	1.95 (1.47-2.60)	1.40 (1.04-1.88)	1.40 (1.04-1.88)	1.40 (1.04-1.88)
Cigarette smoking						
	Non-smoker	5310	1	1	1	1
	Former smoker	270	1.01 (0.74-1.36)	0.95 (0.70-1.28)	0.95 (0.70-1.29)	0.94 (0.70-1.28)
	Current smoker	2963	1.47 (1.30-1.65)	1.12 (0.96-1.31)	1.12 (0.96-1.31)	1.12 (0.96-1.31)
Diabetes	Normal	6707	1	1	1	1
	Pre-diabetes	1323	1.27 (1.08-1.49)	1.08 (0.91-1.28)	1.08 (0.91-1.28)	1.08 (0.91-1.28)
	Diabetes	513	1.66 (1.29-2.12)	1.28 (0.97-1.69)	1.28 (0.97-1.69)	1.27 (0.96-1.69)
Hypercholesterolemia						
	No	7772	1	1	1	1
	Yes	771	1.22 (0.98-1.53)	1.05 (0.83-1.33)	1.05 (0.83-1.33)	1.05 (0.76-1.33)
Hypertension						
	Normal	4730	1	1	1	1
	Pre-HP	1989	1.31 (1.14-1.50)	1.12 (0.96-1.30)	1.12 (0.96-1.30)	1.12 (0.96-1.30)
	HP	1824	1.51 (1.30-1.76)	1.12 (0.94-1.35)	1.12 (0.94-1.34)	1.12 (0.93-1.34)
Obesity	Normal	5685	1	1	1	1
	Under-weight	461	0.74 (0.59-0.93)	0.83 (0.66-1.05)	0.84 (0.66-1.06)	0.83 (0.66-1.05)
	Obesity	2397	1.28 (1.13-1.45)	1.09 (0.96-1.25)	1.09 (0.96-1.25)	1.09 (0.96-1.25)

Reference: healthy (CPI 0).

Bold denotes statistical significance at $p < 0.05$.

^a Adjusted for nutrition factors (vitamin A, C), socio-demographic factors (age, sex, and household income), oral health-related behavior (tooth brushing), general health-related behaviors (physical activity, alcohol drinking, cigarette smoking) and systemic condition factors (diabetes, hypercholesterolemia, hypertension, and obesity).

^b Over tolerable upper intake level.

Table 3. Adjusted associations of dietary vitamin B₁, vitamin B₂, and vitamin B₃ intake (by EAR) with periodontitis (CPI 3-4) by multi-variable logistic regression analysis (N=6959)

Variables	Category	N	Crude odds ratios (95%CI)	Adjusted odds ratios ^a (95% CI)		
				Vitamin B ₁	Vitamin B ₂	Vitamin B ₃
Vitamin B ₁	Adequate	4311	1	1		
	Inadequate	2648	1.26 (1.12-1.42)	1.13 (0.98-1.32)		
Vitamin B ₂	Adequate	2935	1		1	
	Inadequate	4024	1.52 (1.34-1.72)		1.11 (0.95-1.29)	
Vitamin B ₃	Adequate	4341	1			1
	Inadequate	2367	1.28 (1.13-1.45)			1.25 (1.07-1.46)
	Over UL ^b	251	0.92 (0.68-1.25)			0.77 (0.54-1.10)
Vitamin A	Adequate	3921	1	1	1	1
	Inadequate	2845	1.25 (1.12-1.40)	1.09 (0.95-1.25)	1.08 (0.93-1.25)	1.07 (0.93-1.23)
	Over UL	193	1.06 (0.76-1.49)	1.07 (0.74-1.56)	1.09 (0.75-1.58)	1.11 (0.76-1.61)
Vitamin C	Adequate	3853	1	1	1	1
	Inadequate	3105	1.14 (1.01-1.29)	1.17 (1.01-1.35)	1.19 (1.03-1.37)	1.15 (0.99-1.33)
	Over UL	1				
Age (continuous)		6959	1.08 (1.07-1.08)	1.07 (1.06-1.08)	1.07 (1.06-1.07)	1.07 (1.06-1.07)
Sex	Male	3283	1	1	1	1
	Female	3676	0.40 (0.35-0.45)	0.62 (0.51-0.76)	0.64 (0.52-0.78)	0.61 (0.50-0.74)
Monthly household income	Low	1264	1	1	1	1
	Middle-low	1674	0.68 (0.54-0.85)	1.18 (0.92-1.51)	1.18 (0.92-1.51)	1.18 (0.92-1.51)
	Middle-high	1955	0.54 (0.43-0.67)	1.07 (0.83-1.38)	1.07 (0.83-1.38)	1.09 (0.85-1.40)
	High	2066	0.38 (0.30-0.48)	0.76 (0.59-0.99)	0.76 (0.59-0.99)	0.77 (0.60-1.00)
Tooth brushing frequency (daily)	Once or no	863	1	1	1	1
	Twice	2896	0.61 (0.48-0.76)	0.88 (0.69-1.13)	0.89 (0.69-1.13)	0.89 (0.69-1.13)
	Three times or more	3200	0.32 (0.26-0.40)	0.67 (0.52-0.87)	0.68 (0.52-0.87)	0.68 (0.53-0.87)
Physical activity (walking)						

	No	789	1	1	1	1
	1-4 /week	2462	0.80 (0.65-0.97)	0.98 (0.79-1.23)	0.98 (0.79-1.22)	0.98 (0.78-1.22)
	5-7 /week	3708	0.74 (0.61-0.90)	0.89 (0.71-1.11)	0.88 (0.71-1.11)	0.88 (0.70-1.10)
Alcohol drinking (past one year)						
	0-1 /Month	3532	1	1	1	1
	2-4 /Month	1709	0.89 (0.77-1.03)	1.02 (0.86-1.21)	1.02 (0.86-1.21)	1.03 (0.87-1.22)
	2-3/Week	1093	1.41 (1.18-1.68)	1.10 (0.90-1.34)	1.10 (0.90-1.35)	1.11 (0.90-1.35)
	Over 4/Week	625	4.28 (3.25-5.63)	1.90 (1.40-2.59)	1.91 (1.40-2.60)	1.92 (1.41-2.62)
Smoking						
	Non-smoker	3762	1	1	1	1
	Former smoker	176	0.80 (0.55-1.16)	0.92 (0.62-1.37)	0.92 (0.62-1.38)	0.90 (0.60-1.35)
	Current smoker	3021	2.75 (2.42-3.13)	1.62 (1.33-1.98)	1.63 (1.33-1.98)	1.63 (1.34-1.99)
Diabetes						
	Normal	4885	1	1	1	1
	Pre-diabetes	1393	2.38 (2.02-2.81)	1.14 (0.94-1.38)	1.14 (0.94-1.38)	1.14 (0.94-1.38)
	Diabetes	681	4.73 (3.76-5.95)	1.65 (1.25-2.17)	1.65 (1.26-2.18)	1.63 (1.24-2.15)
Hypercholesterolemia						
	No	6175	1	1	1	1
	Yes	784	1.91 (1.56-2.34)	1.02 (0.82-1.27)	1.02 (0.82-1.27)	1.02 (0.62-1.27)
Hypertension						
	Normal	3223	1	1	1	1
	Pre-HP	1716	1.89 (1.63-2.19)	1.03 (0.86-1.22)	1.03 (0.86-1.22)	1.03 (0.86-1.22)
	HP	2020	3.50 (3.00-4.07)	0.94 (0.76-1.15)	0.94 (0.76-1.15)	0.94 (0.76-1.15)
Obesity						
	Normal	4490	1	1	1	1
	Under-weight	314	0.53 (0.40-0.69)	0.91 (0.66-1.25)	0.91 (0.66-1.26)	0.90 (0.66-1.25)
	Obesity	2155	1.65 (1.45-1.88)	1.19 (1.01-1.39)	1.19 (1.01-1.39)	1.19 (1.02-1.40)

Reference: healthy (CPI 0).

Bold denotes statistical significance at $p < 0.05$.

^a Adjusted for nutrition factors (vitamin A, C), socio-demographic factors (age, sex, and household income), oral health-related behavior (tooth brushing), general health-related behaviors (physical activity, alcohol drinking, cigarette smoking) and systemic condition factors (diabetes, hypercholesterolemia, hypertension, and obesity).

^b Over tolerable upper intake level.

Table 4. Stratified association of age and sex, dyslipidemia and total energy intake of dietary vitamin B₃ intake with periodontitis (CPI 3-4) by EAR (N=6959)

Stratum	Category	N	Adjusted odds ratios ^a (95% CI) of Vit B ₃		
			Adequate ^b	Inadequate ^c	Over UL ^d
Age	19-39	2093	1	1.39 (1.05-1.85)	0.71 (0.39-1.32)
	40-59	2924	1	1.59 (1.23-2.06)	0.81 (0.48-1.37)
	≥ 60	1942	1	0.83 (0.59-1.17)	0.99 (0.37-2.66)
Sex	Male	3283	1	1.01 (0.78-1.30)	0.76 (0.51-1.13)
	Female	3676	1	1.45 (1.19-1.79)	0.62 (0.34-1.16)
Dyslipidemia	No	6386	1	1.25 (1.07-1.48)	0.80 (0.55-1.15)
	Yes	573	1	1.06 (0.60-1.88)	0.65 (0.22-1.92)
Total energy intake	Above EER ^e	2488	1	1.08 (0.61-1.91)	0.78 (0.54-1.15)
	Below EER	4471	1	1.24 (1.05-1.48)	0.94 (0.28-3.19)

Reference: healthy (CPI 0).

Results by complex samples multi-variable logistic regression analysis within each stratum selected cases.

Bold denotes statistical significance.

^a Adjusted for nutrition factors (vitamin A, C), socio-demographic factors (age, sex, and household income), oral health-related behavior (tooth brushing), general health-related behaviors (physical activity, alcohol drinking, cigarette smoking) and systemic condition factors (diabetes, dyslipidemia, hypertension, and obesity) except for categorical stratum.

^b Adequate intake: 12 ≤ intake < 35 mg/day for male, 11 ≤ intake < 35 mg/day for female.

^c Inadequate intake: < 12 mg/day for male, < 11mg/day for female.

^d Over tolerable upper intake level: ≥ 35 mg/day.

^e Estimated energy requirement: Male 19-29 age; 2600 kcal/day, 30-49 age; 2400 kcal/day, 50-64 age; 2,200 kcal/day, over 65 age; 2,000 kcal/day; Female 19-29 age; 2,100 kcal/day, 30-49 age; 1,900 kcal/day, 50-64 age; 1,800 kcal/day, over 65 age; 1,600 kcal/day.

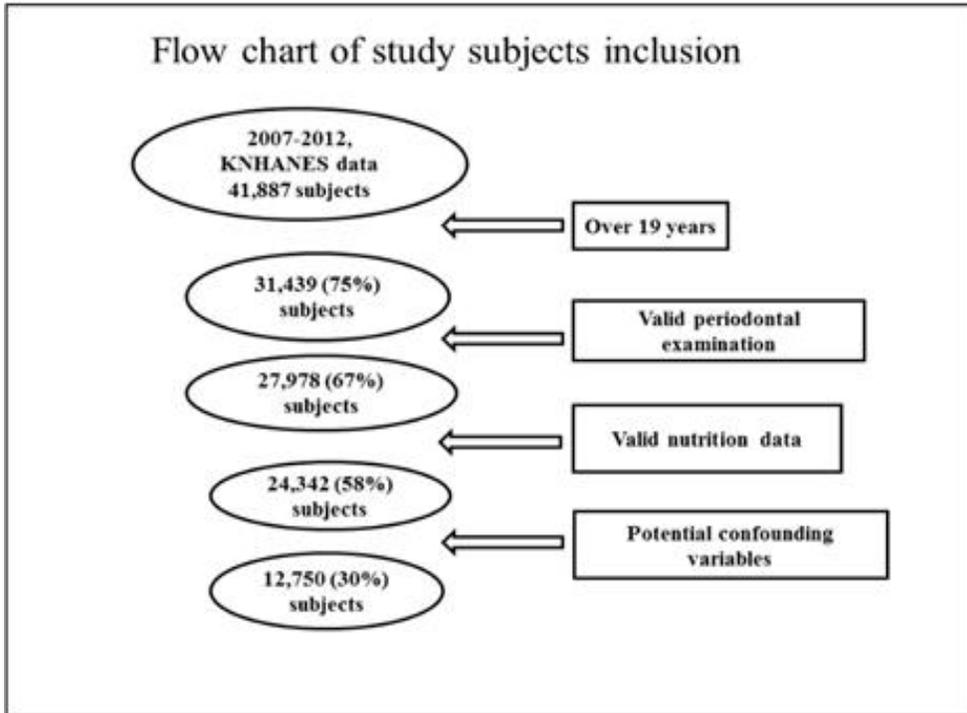


Figure 1. Flow chart of the participants for this study

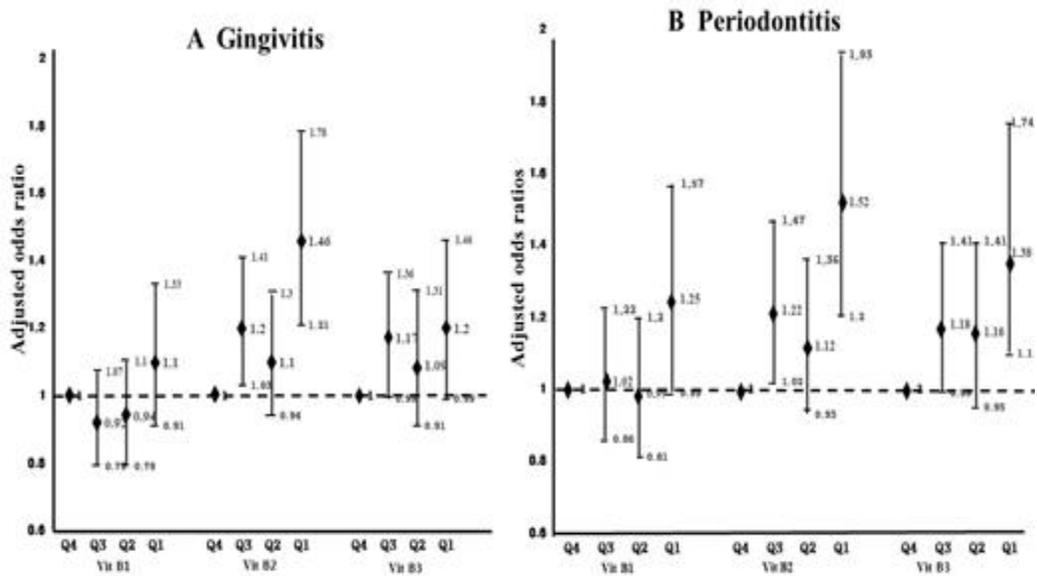


Figure 2. Association between vitamin B1, B2, and B3 in quartile and periodontal status.

Adjusted odds ratios of A) gingivitis, B) periodontitis after adjusting for nutrition factors (vitamin A, C), socio-demographic factors (age, sex, and household income), oral health-related behavior (tooth brushing), general health-related behaviors (physical activity, alcohol drinking, cigarette smoking) and systemic condition factors (diabetes, dyslipidemia, hypertension, and obesity). Diamond and bar represent adjusted odds ratios and 95% confidence intervals. Horizontal dotted line is a null. Highest quartile (Q4) is a reference (odds ratio = 1).

References

1. Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. *The Lancet* 2005;366:1809-1820.
2. Eke PI, Dye BA, Wei L, et al. Update on Prevalence of Periodontitis in Adults in the United States: NHANES 2009 to 2012. *Journal of periodontology*. 2015;86:611-622.
3. Guerra F, Mazur M, Ndokaj A, et al. Periodontitis and the microbiome: a systematic review and meta-analysis. *Minerva Stomatol*. 2018;67(6):250-258.
4. Han DH, Lim S, Paek D, Kim HD. Periodontitis could be related factors on metabolic syndrome among Koreans: a case-control study. *Journal of clinical periodontology*. 2012;39(1):30-37.
5. Han DH, Lim SY, Sun BC, Paek DM, Kim HD. Visceral fat area-defined obesity and periodontitis among Koreans. *Journal of clinical periodontology*. 2010;37(2):172-179.
6. Nelson RG, Shlossman M, Budding LM, et al. Periodontal disease and NIDDM in Pima Indians. *Diabetes care*. 1990;13(8):836-840.
7. Ahn YB, Shin MS, Byun JS, Kim HD. The association of hypertension with periodontitis is highlighted in female adults: results from the Fourth Korea National Health and Nutrition Examination Survey. *Journal of clinical periodontology*. 2015;42(11):998-1005.
8. Papapanou PN. Periodontal Diseases: Epidemiology. *Annals of Periodontology*. 1996;1(1):1-36.
9. Tezal M, Grossi SG, Ho AW, Genco RJ. Alcohol consumption and periodontal disease. The Third National Health and Nutrition Examination Survey. *Journal of clinical periodontology*. 2004;31(7):484-488.
10. Genco RJ, Ho AW, Grossi SG, Dunford R, Tedesco L. Relationship of stress, distress, and inadequate coping behaviors to periodontal disease. *Journal of periodontology*. 1999;70(7):711-723.
11. Hong KW, Shin MS, Ahn YB, Lee HJ, Kim HD. Genomewide association study on chronic periodontitis in Korean population: results from the Yangpyeong health cohort. *Journal of clinical periodontology*. 2015;42:703-710.
12. Han DH, Lim SY, Sun BC, et al. Mercury exposure and periodontitis among a Korean population: the Shiwha-Banwol environmental health study. *Journal of periodontology*. 2009;80(12):1928-1936.
13. Lee JH, Shin YJ, Lee JH, Kim HD. Association of toothbrushing and proximal cleaning with periodontal health among Korean adults: Results from Korea National Health and

- Nutrition Examination Survey in year 2010 and 2012. *Journal of clinical periodontology*. 2018;45(3):322-335.
14. Palacios C, Joshipura K, Willett W. Nutrition and health: guidelines for dental practitioners. *Oral Dis*. 2009;15:369-381.
 15. Schifferle RE. Periodontal disease and nutrition: separating the evidence from current fads. *Periodontology* 2000. 2009;50:78-89.
 16. Zhu Y, Hollis JH. Tooth loss and its association with dietary intake and diet quality in American adults. *J Dent*. 2014;42:1428-1435.
 17. Walls AWG, Steele JG. The relationship between oral health and nutrition in older people. *Mechanisms of Ageing and Development*. 2004;125:853-857.
 18. Schifferle RE. Nutrition and periodontal disease. *Dent Clin North Am*. 2005;49(3):595-610, vii.
 19. Lee JH, Shin MS, Kim EJ, Ahn YB, Kim HD. The association of dietary vitamin C intake with periodontitis among Korean adults: Results from KNHANES. *PloS one*. 2017;12:e0177074.
 20. Albina JE. Nutrition and wound healing. *JPEN J Parenter Enteral Nutr*. 1994;18(4):367-376.
 21. Neiva RF, Al-Shammari K, Nociti FH, Soehren S, Wang H-L. Effects of Vitamin-B Complex Supplementation on Periodontal Wound Healing. *Journal of periodontology*. 2005;76:1084-1091.
 22. Altschul R, Hoffer A, Stephen JD. Influence of nicotinic acid on serum cholesterol in man. *Archives of biochemistry and biophysics*. 1955;54:558-559.
 23. Jacobson EL, Kim H, Kim M, Jacobson MK. Niacin: vitamin and antidyslipidemic drug. *Subcell Biochem*. 2012;56:37-47.
 24. Dreizen S, Levy BM, Bernick S. Studies on the biology of the periodontium of marmosets. XIII. Histopathology of niacin deficiency stomatitis in the marmoset. *Journal of periodontology*. 1977;48:452-455.
 25. Taguchi S, Wada T, Kijima S, et al. [Effects of nicotinate ethyl ester treatment on gingival blood circulation of experimental gingivitis in monkeys]. *Nihon Shishubyo Gakkai kaishi*. 1989;31(1):184-199.
 26. Yu YH, Kuo HK, Lai YL. The association between serum folate levels and periodontal disease in older adults: data from the National Health and Nutrition Examination Survey 2001/02. *Journal of the American Geriatrics Society*. 2007;55(1):108-113.
 27. Zong G, Holtfreter B, Scott AE, et al. Serum vitamin B12 is inversely associated with periodontal progression and risk of tooth loss: a prospective cohort study. *Journal of clinical periodontology*. 2016;43(1):2-9.

28. Korea National Health and Nutrition Examination Survey, Homepage Data download. 2018 https://knhanes.cdc.go.kr/knhanes/sub03/sub03_02_02.do. Accessed March 13, 2018.
29. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Journal of clinical epidemiology*. 2008;61:344-349.
30. World Health Organization. *Oral health surveys: basic methods* World Health Organization. Geneva;1997, 36-39.
31. Korea Centers for Disease Control & Prevention. *Standardization for Oral Health Survey in KNHANES (2007)*. Seoul, 2008: 7-11.
32. Korea Centers for Disease Control & Prevention. *Standardization for Oral Health Survey in KNHANES (2008)*. Seoul, 2009: 57-65.
33. Korea Centers for Disease Control & Prevention. *Standardization for Oral Health Survey in KNHANES (2009)*. Seoul, 2010: 53-56.
34. Korea Center for Disease Control & Prevention. *Standardization for oral health survey in KNHANES (2010)*. Osung, 2011: 54-58.
35. Korea Center for Disease Control & Prevention. *Standardization for oral health survey in KNHANES (2012)*. Osung, 2013: 49-53.
36. Salvador Castell G, Serra-Majem L, Ribas-Barba L. What and how much do we eat? 24-hour dietary recall method. *Nutr Hosp*. 2015;31 Suppl 3:46-48.
37. Buchowski MS. Doubly labeled water is a validated and verified reference standard in nutrition research. *The Journal of nutrition*. 2014;144:573-574.
38. The Korean Nutrition Society. *Dietary reference intakes for Koreans (KDRI) 2015*. Seoul, Korea: The Korean Nutrition Society;2015, 18-19.
39. Korea Center for Disease Control & Prevention. *Korean national health and nutrition examination survey, nutrition survey guide lines (2010-2012)*. 2016, 33-52.
40. Report of the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine. *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline*, Washington (DC). In: *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline*. Washington (DC): National Academies Press (US), National Academy of Sciences; 1998: 1-11.
41. Murphy SP, Poos MI. Dietary Reference Intakes: summary of applications in dietary assessment. *Public health nutrition*. 2002;5:843-849.
42. Kaye EK. Nutrition, dietary guidelines and optimal periodontal health. *Periodontology 2000*. 2012;58:93-111.

43. Groenwold RH, Klungel OH, Grobbee DE, Hoes AW. Selection of confounding variables should not be based on observed associations with exposure. *European journal of epidemiology*. 2011;26:589-593.
44. Sontrop JM, Campbell MK, Evers SE, Speechley KN, Avison WR. Fish consumption among pregnant women in London, Ontario: associations with socio-demographic and health and lifestyle factors. *Canadian journal of public health = Revue canadienne de sante publique*. 2007;98:389-394.
45. Johansson LR, Solvoll K, Bjorneboe GE, Drevon CA. Intake of very-long-chain n-3 fatty acids related to social status and lifestyle. *European journal of clinical nutrition*. 1998;52:716-721.
46. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes care*. 2004;27 Suppl 1:S5-s10.
47. Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *Jama*. 2003;289:2560-2572.
48. WHO expert consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet*. 2004;363:157-163.
49. Lee J-B, Yi H-Y, Bae K-H. The association between periodontitis and dyslipidemia based on the fourth Korea National Health and Nutrition Examination Survey. *Journal of clinical periodontology*. 2013;40:437-442.
50. Iwasaki M, Sato M, Minagawa K, Manz MC, Yoshihara A, Miyazaki H. Longitudinal relationship between metabolic syndrome and periodontal disease among Japanese adults aged ≥ 70 years: the Niigata Study. *Journal of periodontology*. 2015;86:491-498.
51. Lei L, Li H, Yan F, Xiao Y. Hyperlipidemia impaired innate immune response to periodontal pathogen porphyromonas gingivalis in apolipoprotein E knockout mice. *PloS one*. 2013;8:e71849.
52. Zhou X, Zhang W, Liu X, Zhang W, Li Y. Interrelationship between diabetes and periodontitis: role of hyperlipidemia. *Archives of oral biology*. 2015;60:667-674.
53. Meisel P, Kroemer HK, Nauck M, Holtfreter B, Kocher T. Tooth loss, periodontitis, and statins in a population-based follow-up study. *Journal of periodontology*. 2014;85:e160-168.
54. Goldie C, Taylor AJ, Nguyen P, McCoy C, Zhao XQ, Preiss D. Niacin therapy and the risk of new-onset diabetes: a meta-analysis of randomised controlled trials. *Heart*. 2016;102:198-203.

55. Niacin Fact Sheet for Health Professionals, Health information, National Institutes of Health, U.S. Department of Health & Human Services. 2019. <https://ods.od.nih.gov/factsheets/Niacin-HealthProfessional/>. Accessed 13 Nov, 2019.
56. Report of the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline, Washington (DC). In: *Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline*. Washington (DC): National Academies Press (US), National Academy of Sciences; 1998: 138-142.
57. Goel H, Dunbar RL. Niacin Alternatives for Dyslipidemia: Fool's Gold or Gold Mine? Part II: Novel Niacin Mimetics. *Curr Atheroscler Reports*. 2016;18:DOI 10.1007/s11883-11016-10570-11889.
58. Kumar J, Teoh SL, Das S, Mahaknaukrauh P. Oxidative Stress in Oral Diseases: Understanding Its Relation with Other Systemic Diseases. *Frontiers in physiology*. 2017;8:693 DOI 610.3389/fphys.2017.00693.
59. Spronck JC, Bartleman AP, Boyonoski AC, Kirkland JB. Chronic DNA damage and niacin deficiency enhance cell injury and cause unusual interactions in NAD and poly(ADP-ribose) metabolism in rat bone marrow. *Nutrition and cancer*. 2003;45:124-131.
60. Kostecki LM, Thomas M, Linford G, et al. Niacin deficiency delays DNA excision repair and increases spontaneous and nitrosourea-induced chromosomal instability in rat bone marrow. *Mutation research*. 2007;625(1-2):50-61.

한국성인에서 티아민 리보플라빈 및 나이아신 섭취의 치주염에 대한 연관성

서울대학교 대학원
치의과학과 예방·사회치의학 전공
(지도교수: 김 현 덕)

이 정 후

1. 연구목적

적절한 비타민 B 복합체의 섭취는 건강에 필수적이다. 그러나, 비타민 B 복합체에 속하는 티아민(Thiamine, 비타민 B1) 리보플라빈(Riboflavin, 비타민 B2) 및 나이아신(Niacin, 비타민 B3)과 치주질환의 연관성에 관한 연구는 아직 부족하다. 따라서, 본 연구의 목적은 한국 성인에서 비타민 B1, B2, B3 섭취와 치주질환의 연관성을 평가함이다.

2. 연구 대상 및 방법

한국 국민건강영양조사 (KNHANES IV and V, 2007-20012년도) 자료에서 추출한 19세 이상 성인 12,750명을 연구 대상으로 하였다. 대표적 치주질환(periodontal disease)인 치은염(gingivitis)과 치

주염(periodontitis)은 결과변수(outcome variables)로 지역사회치주지수 (Community Periodontal Index) 점수 1-2 와 3-4로 각각 분류되었다. 설명변수(explanatory variables)인 비타민 B1, B2, B3의 영양섭취 정보는 24시간 회상법(24 hour dietary recall method)으로 평가되었다. 비타민 B1, B2, B3의 치주질환에 대한 보정 교차비(adjusted odds ratio)는 다 변수 복합 로지스틱 회귀분석(Multi-variable complex logistic regression analysis)을 사용하여 잠재적 교란요인(various potential confounders)을 보정하여 평가되었다. 특히 비타민 B3의 치주염에 대한 연관성은 연령별, 성별, 이상지질혈증 (dyslipidemia)별 및 총 에너지 섭취량(total energy intake)별 층화분석(stratified analysis)으로 세부 평가되었다.

3. 연구 결과

조사대상자 12,750명에서 가중치가 부여된 치은염 유병율과 치주염 유병율은 각각 46.6%와 29.9%이었다. 교란요인을 보정한 복합 다변수 로지스틱 회귀분석 (complex multi-variable logistic regression analysis)으로 분석결과, 비타민 B1, B2, B3 부족 섭취는 치은염과 일관된 유의한 연관성을 보이지 않았고, 비타민 B1, B2 부족 섭취도 치주염과 유의한 연관성을 보이지 않았으나, 비타민 B3 부족 섭취는 사분위(quartile)와 평균필요량(EAR)에서 모두 치주염과 연관성을 보였다 (adjusted odds ratio of vitamin B3 by EAR=1.25, 95% CI=1.07-1.46). 특히 비타민 B3 부족 섭취의 치주염에 대한 연관성은, 여성과 40-59세 성인에서 크게 증가하였다.

4. 결론

비타민 B3 부족 섭취는 치주염과 유의한 연관성이 있었다.

주요 어 (key words);
티아민 (Thiamine), 리보플라빈 (Riboflavin) 나이아신 (Niacin),
역학 (epidemiology), 치은염 (gingivitis), 치주염 (periodontitis)

학번; 2011-31197

- Appendix -

Appendix 1. Raw data by SPSS statistics

1-1. Raw data by SPSS statistics for Table 1

Table 1 Characteristics of the participants according to periodontal status (N=12750)

1-1-1 Age (by ANOVA test)

Descriptives

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
CPI 0 healthy	2752	41.37	14.601	.278	40.82	41.91	19	87
CPI 1-2 gingivitis	5791	43.98	14.898	.196	43.59	44.36	19	93
CPI 3-4 periodontitis	4207	54.05	13.356	.206	53.65	54.45	19	91
Total	12750	46.74	15.263	.135	46.47	47.00	19	93

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	348377.914	2	174188.957	846.903	.000
Within Groups	2621772.564	12747	205.678		
Total	2970150.479	12749			

1-1-2 Chi Square test (by complex sample analysis)

1-1-2-1 Sex

성별 * 3 분류 치주질환^a

성별	3 분류 치주질환				
	CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계	
남자	3 분류 치주질환 중 % 추정값	42.3%	52.7%	64.9%	53.9%
	표준오차	1.2%	0.8%	0.8%	0.5%
	95% 신뢰구간 하한	39.9%	51.3%	63.3%	53.0%
	상한	44.7%	54.2%	66.5%	54.9%
	가중되지 않은 빈도	913	2390	2370	5673
여자	3 분류 치주질환 중 % 추정값	57.7%	47.3%	35.1%	46.1%
	표준오차	1.2%	0.8%	0.8%	0.5%
	95% 신뢰구간 하한	55.3%	45.8%	33.5%	45.1%
	상한	60.1%	48.7%	36.7%	47.0%
	가중되지 않은 빈도	1839	3401	1837	7077
합계	3 분류 치주질환 중 % 추정값	100.0%	100.0%	100.0%	100.0%
	표준오차	0.0%	0.0%	0.0%	0.0%
	95% 신뢰구간 하한	100.0%	100.0%	100.0%	100.0%
	상한	100.0%	100.0%	100.0%	100.0%
	가중되지 않은 빈도	2752	5791	4207	12750

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	405.929 ^a	2	.000
	Likelihood Ratio	407.946	2	.000
	Linear-by-Linear Association	390.677	1	.000
	N of Valid Cases	12750		

1-1-2-2 Monthly house income

소득사분위수 (가구) * 3 분류 치주질환^a

소득사분위수 (가구)		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
1	3 분류 치주질환 중 %	추정값	9.2%	11.2%	16.7%	12.4%	
		표준오차	0.8%	0.6%	0.8%	0.5%	
		95% 신뢰구간	하한	7.8%	10.0%	15.2%	11.5%
			상한	10.8%	12.5%	18.4%	13.4%
		가중되지 않은 빈도	291	830	973	2094	
2	3 분류 치주질환 중 %	추정값	21.4%	23.8%	26.3%	24.0%	
		표준오차	1.1%	0.9%	1.0%	0.7%	
		95% 신뢰구간	하한	19.3%	22.2%	24.5%	22.7%
			상한	23.7%	25.5%	28.3%	25.3%
		가중되지 않은 빈도	561	1396	1113	3070	
3	3 분류 치주질환 중 %	추정값	30.4%	30.8%	29.8%	30.4%	
		표준오차	1.1%	0.9%	1.0%	0.7%	
		95% 신뢰구간	하한	28.2%	29.1%	27.9%	29.1%
			상한	32.6%	32.6%	31.7%	31.7%
		가중되지 않은 빈도	846	1692	1109	3647	
4	3 분류 치주질환 중 %	추정값	39.1%	34.1%	27.2%	33.2%	
		표준오차	1.5%	1.1%	1.1%	0.9%	
		95% 신뢰구간	하한	36.3%	32.0%	25.0%	31.5%
			상한	42.0%	36.4%	29.5%	35.0%
		가중되지 않은 빈도	1054	1873	1012	3939	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		표준오차	0.0%	0.0%	0.0%	0.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	342.398 ^a	6	.000
	Likelihood Ratio	340.762	6	.000
	Linear-by-Linear Association	322.343	1	.000
	N of Valid Cases	12750		

1-1-2-3 Tooth brushing frequency

하루치솔질 횟수 * 3 분류 치주질환^a

하루치솔질 횟수			3 분류 치주질환				
			CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계	
once or no/day	3 분류 치주질환 중 %	추정값	6.6%	9.5%	14.2%	10.3%	
		표준오차	0.6%	0.5%	0.7%	0.3%	
		95% 신뢰구간	하한	5.5%	8.7%	13.0%	9.6%
		상한	7.9%	10.5%	15.6%	11.0%	
		가중되지 않은 빈도	200	619	663	1482	
twice/day	3 분류 치주질환 중 %	추정값	35.1%	40.7%	45.6%	40.9%	
		표준오차	1.1%	0.8%	0.9%	0.6%	
		95% 신뢰구간	하한	33.0%	39.1%	43.8%	39.8%
		상한	37.3%	42.4%	47.4%	42.0%	
		가중되지 않은 빈도	968	2396	1928	5292	
thrice or more/day	3 분류 치주질환 중 %	추정값	58.3%	49.7%	40.2%	48.9%	
		표준오차	1.2%	0.9%	1.0%	0.6%	
		95% 신뢰구간	하한	55.9%	48.0%	38.3%	47.7%
		상한	60.6%	51.5%	42.1%	50.1%	
		가중되지 않은 빈도	1584	2776	1616	5976	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		표준오차	0.0%	0.0%	0.0%	0.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
		상한	100.0%	100.0%	100.0%	100.0%	
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	289.419 ^a	4	.000
	Likelihood Ratio	290.757	4	.000
	Linear-by-Linear Association	284.633	1	.000
	N of Valid Cases	12750		

1-1-2-4 Physical activity (walking)

Physical activity 1 주일간 걸기일수 * 3 분류 치주질환^a

Physical activity 1 주일간 걸기일수		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
운동 안함	3 분류 치주질환 중 %	추정값	9.4%	11.0%	12.0%	10.9%	
		표준오차	0.7%	0.5%	0.6%	0.4%	
		95% 신뢰구간	하한	8.2%	10.0%	10.8%	10.2%
			상한	10.8%	12.2%	13.3%	11.7%
		가중되지 않은 빈도	279	700	510	1489	
1일에서 4일	3 분류 치주질환 중 %	추정값	36.6%	36.5%	37.0%	36.7%	
		표준오차	1.1%	0.8%	0.9%	0.5%	
		95% 신뢰구간	하한	34.4%	35.1%	35.2%	35.7%
			상한	38.8%	38.0%	38.8%	37.7%
		가중되지 않은 빈도	1038	2084	1424	4546	
5일-7일	3 분류 치주질환 중 %	추정값	54.0%	52.4%	51.0%	52.4%	
		표준오차	1.2%	0.9%	1.0%	0.6%	
		95% 신뢰구간	하한	51.6%	50.7%	49.1%	51.2%
			상한	56.4%	54.1%	52.9%	53.5%
		가중되지 않은 빈도	1435	3007	2273	6715	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		표준오차	0.0%	0.0%	0.0%	0.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	16.677 ^a	4	.002
	Likelihood Ratio	16.918	4	.002
	Linear-by-Linear Association	.035	1	.852
	N of Valid Cases	12750		

1-1-2-5 Alcohol drinking

최근1년간음주빈도 * 3 분류 치주질환^a

최근1년간음주빈도		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
0-1 per month	3 분류 치주질환 중 %	추정값	48.6%	46.1%	42.4%	45.6%	
		표준오차	1.3%	0.8%	0.9%	0.6%	
		95% 신뢰구간	하한	46.1%	44.5%	40.6%	44.5%
			상한	51.1%	47.7%	44.2%	46.7%
		가중되지 않은 빈도	1501	2979	2031	6511	
2~4 per month	3 분류 치주질환 중 %	추정값	31.5%	29.4%	24.5%	28.4%	
		표준오차	1.1%	0.7%	0.8%	0.5%	
		95% 신뢰구간	하한	29.4%	28.0%	22.9%	27.4%
			상한	33.6%	30.9%	26.1%	29.4%
		가중되지 않은 빈도	775	1518	934	3227	
2~3 per week	3 분류 치주질환 중 %	추정값	16.4%	18.0%	20.1%	18.3%	
		표준오차	0.9%	0.6%	0.8%	0.4%	
		95% 신뢰구간	하한	14.7%	16.8%	18.6%	17.4%
			상한	18.4%	19.3%	21.8%	19.2%
		가중되지 않은 빈도	378	897	715	1990	
over 4 per week	3 분류 치주질환 중 %	추정값	3.5%	6.5%	13.0%	7.7%	
		표준오차	0.4%	0.4%	0.6%	0.3%	
		95% 신뢰구간	하한	2.8%	5.7%	11.8%	7.2%
			상한	4.4%	7.3%	14.3%	8.3%
		가중되지 않은 빈도	98	397	527	1022	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		표준오차	0.0%	0.0%	0.0%	0.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	235.936 ^a	6	.000
	Likelihood Ratio	239.140	6	.000
	Linear-by-Linear Association	139.209	1	.000
	N of Valid Cases	12750		

1-1-2-6 Cigarette smoking status

smoking status * 3 분류 치주질환³

smoking status			3 분류 치주질환				
			CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	Total	
No smoker	% within 3 분류 치주질환	Estimate	60.3%	51.7%	37.4%	49.4%	
		95% Confidence Interval	Lower	57.9%	50.1%	35.7%	48.4%
			Upper	62.6%	53.3%	39.1%	50.4%
		Unweighted Count	1857	3453	1905	7215	
former smoker	% within 3 분류 치주질환	Estimate	4.2%	3.7%	2.1%	3.3%	
		95% Confidence Interval	Lower	3.4%	3.1%	1.6%	2.9%
			Upper	5.3%	4.3%	2.7%	3.7%
		Unweighted Count	92	178	84	354	
current smoker	% within 3 분류 치주질환	Estimate	35.5%	44.6%	60.5%	47.2%	
		95% Confidence Interval	Lower	33.2%	43.1%	58.7%	46.3%
			Upper	37.8%	46.2%	62.3%	48.2%
		Unweighted Count	803	2160	2218	5181	
Total	% within 3 분류 치주질환	Estimate	100.0%	100.0%	100.0%	100.0%	
		95% Confidence Interval	Lower	100.0%	100.0%	100.0%	100.0%
			Upper	100.0%	100.0%	100.0%	100.0%
		Unweighted Count	2752	5791	4207	12750	

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	432.389 ^a	4	.000
	Likelihood Ratio	433.777	4	.000
	Linear-by-Linear Association	397.571	1	.000
	N of Valid Cases	12750		

1-1-2-7 Diabetes

당뇨 유병여부 * 3분류 치주질환^a

당뇨 유병여부		3분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
정상	3분류 치주질환 중 %	추정값	83.9%	79.4%	64.4%	75.9%	
		표준오차	0.9%	0.7%	0.9%	0.5%	
		95% 신뢰구간	하한	82.1%	78.0%	62.5%	74.9%
		상한	85.5%	80.7%	66.2%	77.0%	
		가중되지 않은 빈도	2261	4446	2624	9331	
공복혈당장애	3분류 치주질환 중 %	추정값	12.8%	15.4%	23.4%	17.2%	
		표준오차	0.8%	0.6%	0.8%	0.5%	
		95% 신뢰구간	하한	11.3%	14.2%	21.8%	16.3%
		상한	14.4%	16.6%	25.1%	18.1%	
		가중되지 않은 빈도	370	953	1023	2346	
당뇨병	3분류 치주질환 중 %	추정값	3.4%	5.3%	12.2%	6.9%	
		표준오차	0.3%	0.4%	0.6%	0.3%	
		95% 신뢰구간	하한	2.8%	4.6%	11.0%	6.4%
		상한	4.1%	6.0%	13.4%	7.4%	
		가중되지 않은 빈도	121	392	560	1073	
합계	3분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		표준오차	0.0%	0.0%	0.0%	0.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
		상한	100.0%	100.0%	100.0%	100.0%	
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	427.610 ^a	4	.000
	Likelihood Ratio	421.150	4	.000
	Linear-by-Linear Association	385.020	1	.000
	N of Valid Cases	12750		

1-1-2-8 Hypercholesterolemia

고콜레스테롤 유병여부 * 3 분류 치주질환^a

고콜레스테롤 유병여부			3 분류 치주질환				
			CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계	
없음	3 분류 치주질환 중 %	추정값	93.2%	91.8%	87.8%	90.9%	
		95% 신뢰구간	하한	91.9%	90.9%	86.6%	90.3%
			상한	94.3%	92.6%	88.8%	91.5%
		가중되지 않은 빈도	2531	5241	3644	11416	
있음	3 분류 치주질환 중 %	추정값	6.8%	8.2%	12.2%	9.1%	
		95% 신뢰구간	하한	5.7%	7.4%	11.2%	8.5%
			상한	8.1%	9.1%	13.4%	9.7%
		가중되지 않은 빈도	221	550	563	1334	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	61.420 ^a	2	.000
	Likelihood Ratio	60.175	2	.000
	Linear-by-Linear Association	56.585	1	.000
	N of Valid Cases	12750		

1-1-2-9 Dyslipidemia

이상 지혈증 유병여부 * 3분류 치주질환^a

이상 지혈증 유병여부		3분류 치주질환			
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계
정상	3분류 치주질환 중 % 추정값	95.2%	94.5%	91.0%	93.7%
	95% 신뢰구간 하한	94.3%	93.8%	89.9%	93.1%
	상한	96.0%	95.2%	92.1%	94.1%
	가중되지 않은 빈도	2577	5412	3809	11798
이상지질	3분류 치주질환 중 % 추정값	4.8%	5.5%	9.0%	6.3%
	95% 신뢰구간 하한	4.0%	4.8%	7.9%	5.9%
	상한	5.7%	6.2%	10.1%	6.9%
	가중되지 않은 빈도	175	379	398	952
합계	3분류 치주질환 중 % 추정값	100.0%	100.0%	100.0%	100.0%
	95% 신뢰구간 하한	100.0%	100.0%	100.0%	100.0%
	상한	100.0%	100.0%	100.0%	100.0%
	가중되지 않은 빈도	2752	5791	4207	12750

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	36.217 ^a	2	.000
	Likelihood Ratio	34.994	2	.000
	Linear-by-Linear Association	27.863	1	.000
	N of Valid Cases	12750		

1-1-2-10 Hypertension

고혈압유병여부 * 3 분류 치주질환^a

고혈압유병여부		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
정상	3 분류 치주질환 중 %	추정값	62.1%	54.2%	39.4%	51.6%	
		95% 신뢰구간	하한	59.7%	52.3%	37.3%	50.2%
			상한	64.5%	56.1%	41.4%	53.0%
		가중되지 않은 빈도	1679	3051	1544	6274	
고혈압 전단계	3 분류 치주질환 중 %	추정값	22.8%	26.0%	27.3%	25.6%	
		95% 신뢰구간	하한	20.9%	24.4%	25.6%	24.6%
			상한	24.8%	27.6%	29.1%	26.7%
		가중되지 않은 빈도	596	1393	1120	3109	
고혈압	3 분류 치주질환 중 %	추정값	15.0%	19.8%	33.3%	22.7%	
		95% 신뢰구간	하한	13.5%	18.5%	31.4%	21.7%
			상한	16.7%	21.2%	35.4%	23.8%
		가중되지 않은 빈도	477	1347	1543	3367	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	518.713 ^a	4	.000
	Likelihood Ratio	520.495	4	.000
	Linear-by-Linear Association	491.094	1	.000
	N of Valid Cases	12750		

1-1-2-11 Obesity

비만유병여부19세이상 * 3분류 치주질환^a

		3분류 치주질환				
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계	
정상	3분류 치주질환 중 %	추정값	68.0%	64.6%	60.1%	64.1%
	95% 신뢰구간	하한	65.9%	63.1%	58.2%	63.0%
		상한	70.0%	66.1%	62.0%	65.1%
	가중되지 않은 빈도		1907	3778	2583	8268
저체중	3분류 치주질환 중 %	추정값	7.0%	4.9%	3.2%	4.9%
	95% 신뢰구간	하한	5.9%	4.3%	2.7%	4.4%
		상한	8.2%	5.6%	4.0%	5.4%
	가중되지 않은 빈도		178	283	136	597
비만	3분류 치주질환 중 %	추정값	25.0%	30.5%	36.6%	31.0%
	95% 신뢰구간	하한	23.1%	29.0%	34.8%	30.0%
		상한	27.1%	32.0%	38.5%	32.1%
	가중되지 않은 빈도		667	1730	1488	3885
합계	3분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%
	95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
		상한	100.0%	100.0%	100.0%	100.0%
	가중되지 않은 빈도		2752	5791	4207	12750

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	123.301 ^a	4	.000
	Likelihood Ratio	124.591	4	.000
	Linear-by-Linear Association	73.380	1	.000
	N of Valid Cases	12750		

1-1-2-12 Estimated energy requirement (EER)

Energy EER * 3 분류 치주질환^a

Energy EER				3 분류 치주질환			
				CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계
Over EER	3 분류 치주질환 중 %	추정값	35.7%	34.9%	37.2%	35.8%	
		95% 신뢰구간					
		하한	33.6%	33.4%	35.3%	34.7%	
		상한	38.0%	36.4%	39.2%	36.9%	
		가중되지 않은 빈도	974	1976	1514	4464	
below EER	3 분류 치주질환 중 %	추정값	64.3%	65.1%	62.8%	64.2%	
		95% 신뢰구간					
		하한	62.0%	63.6%	60.8%	63.1%	
		상한	66.4%	66.6%	64.7%	65.3%	
		가중되지 않은 빈도	1778	3815	2693	8286	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간					
		하한	100.0%	100.0%	100.0%	100.0%	
		상한	100.0%	100.0%	100.0%	100.0%	
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	3.951 ^a	2	.139
	Likelihood Ratio	3.952	2	.139
	Linear-by-Linear Association	.605	1	.437
	N of Valid Cases	12750		

1-1-2-13 Vit A by EAR

VIT A EAR Intake * 3 분류 치주질환^a

VIT A EAR Intake			3 분류 치주질환				
			CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계	
Adequ	3 분류 치주질환 중 %	추정값	61.0%	58.7%	55.8%	58.3%	
		표준오차	1.1%	0.8%	1.0%	0.6%	
		95% 신뢰구간	하한	58.8%	57.0%	53.8%	57.2%
		상한	63.1%	60.3%	57.7%	59.5%	
		가중되지 않은 빈도	1662	3358	2259	7279	
Inadequ	3 분류 치주질환 중 %	추정값	36.4%	39.1%	41.7%	39.2%	
		표준오차	1.1%	0.8%	1.0%	0.6%	
		95% 신뢰구간	하한	34.3%	37.4%	39.7%	38.0%
		상한	38.6%	40.7%	43.6%	40.4%	
		가중되지 않은 빈도	1012	2309	1833	5154	
over UL	3 분류 치주질환 중 %	추정값	2.6%	2.3%	2.6%	2.5%	
		표준오차	0.4%	0.2%	0.3%	0.2%	
		95% 신뢰구간	하한	2.0%	1.8%	2.0%	2.1%
		상한	3.4%	2.8%	3.2%	2.8%	
		가중되지 않은 빈도	78	124	115	317	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		표준오차	0.0%	0.0%	0.0%	0.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
		상한	100.0%	100.0%	100.0%	100.0%	
		가중되지 않은 빈도	2752	5791	4207	12750	

Chi-Square Tests

Niacin 눈분 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	39.520 ^a	4	.000
	Likelihood Ratio	39.668	4	.000
	Linear-by-Linear Association	27.196	1	.000
	N of Valid Cases	12750		

1-1-2-14 Vit C by EAR

Vit C EAR Intake ^ 3 분류 치주질환^a

Vit C EAR Intake		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
Adequ	3 분류 치주질환 중 %	추정값	58.8%	55.5%	55.5%	56.3%	
		95% 신뢰구간	하한	56.4%	53.7%	53.5%	55.0%
			상한	61.1%	57.2%	57.5%	57.5%
		가중되지 않은 빈도	1625	3172	2228	7025	
Inadequ	3 분류 치주질환 중 %	추정값	41.2%	44.5%	44.5%	43.7%	
		95% 신뢰구간	하한	38.9%	42.8%	42.5%	42.5%
			상한	43.6%	46.3%	46.5%	45.0%
		가중되지 않은 빈도	1126	2619	1979	5724	
over UL	3 분류 치주질환 중 %	추정값	0.0%			0.0%	
		95% 신뢰구간	하한	0.0%			0.0%
			상한	0.2%			0.0%
		가중되지 않은 빈도	1			1	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	29.190 ^a	4	.000
	Likelihood Ratio	28.722	4	.000
	Linear-by-Linear Association	23.207	1	.000
	N of Valid Cases	12750		

1-1-2-15 Vit B1 EAR

Vit B1 EAR Intake * 3 분류 치주질환^a

Vit B1 EAR Intake		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
Adequ	3 분류 치주질환 중 %	추정값	68.4%	65.8%	63.3%	65.6%	
		95% 신뢰구간	하한	66.3%	64.3%	61.5%	64.6%
			상한	70.4%	67.3%	65.0%	66.7%
		가중되지 않은 빈도	1822	3598	2489	7909	
Inadequ	3 분류 치주질환 중 %	추정값	31.6%	34.2%	36.7%	34.4%	
		95% 신뢰구간	하한	29.6%	32.7%	35.0%	33.3%
			상한	33.7%	35.7%	38.5%	35.4%
		가중되지 않은 빈도	930	2193	1718	4841	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	35.085 ^a	2	.000
	Likelihood Ratio	35.274	2	.000
	Linear-by-Linear Association	34.679	1	.000
	N of Valid Cases	12750		

1-1-2-16 Vit B1 by Quartile

B1 집단 Quartile 분류 * 3 분류 치주질환^a

B1 집단 Quartile 분류		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
-0.774	3 분류 치주질환 중 %	추정값	19.3%	21.6%	23.4%	21.6%	
		95% 신뢰구간	하한	17.7%	20.2%	21.9%	20.7%
			상한	21.0%	23.0%	25.1%	22.6%
		가중되지 않은 빈도	597	1443	1147	3187	
0.774-1.097	3 분류 치주질환 중 %	추정값	25.2%	23.3%	23.1%	23.7%	
		95% 신뢰구간	하한	23.4%	22.0%	21.6%	22.8%
			상한	27.2%	24.6%	24.6%	24.6%
		가중되지 않은 빈도	727	1431	1030	3188	
1.097-1.555	3 분류 치주질환 중 %	추정값	26.7%	25.0%	26.0%	25.7%	
		95% 신뢰구간	하한	24.7%	23.7%	24.4%	24.8%
			상한	28.7%	26.4%	27.7%	26.7%
		가중되지 않은 빈도	714	1430	1044	3188	
1.555-	3 분류 치주질환 중 %	추정값	28.8%	30.1%	27.5%	29.0%	
		95% 신뢰구간	하한	26.7%	28.7%	25.8%	28.0%
			상한	31.0%	31.6%	29.3%	30.1%
		가중되지 않은 빈도	714	1487	986	3187	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	30.950 ^a	6	.000
	Likelihood Ratio	31.285	6	.000
	Linear-by-Linear Association	19.175	1	.000
	N of Valid Cases	12750		

1-1-2-17 Vit B2 by EAR

Vit B2 EAR Intake * 3 분류 치주질환^a

Vit B2 EAR Intake		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
Adequ	3 분류 치주질환 중 %	추정값	51.6%	47.5%	41.2%	46.6%	
		95% 신뢰구간	하한	49.3%	45.8%	39.2%	45.4%
			상한	53.9%	49.2%	43.3%	47.8%
		가중되지 않은 빈도	1377	2614	1558	5549	
Inadequ	3 분류 치주질환 중 %	추정값	48.4%	52.5%	58.8%	53.4%	
		95% 신뢰구간	하한	46.1%	50.8%	56.7%	52.2%
			상한	50.7%	54.2%	60.8%	54.6%
		가중되지 않은 빈도	1375	3177	2649	7201	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	125.728 ^a	2	.000
	Likelihood Ratio	126.361	2	.000
	Linear-by-Linear Association	122.477	1	.000
	N of Valid Cases	12750		

1-1-2-18 Vit B2 by Quartile

B2 진단 Quartile 분류 * 3 분류 치주질환^a

B2 진단 Quartile 분류		3 분류 치주질환				
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계	
-0.690	3 분류 치주질환 중 %	추정값	17.1%	21.2%	24.0%	21.1%
		95% 신뢰구간 하한	15.6%	19.9%	22.4%	20.1%
		상한	18.8%	22.6%	25.6%	22.0%
		가중되지 않은 빈도	547	1415	1225	3187
0.690-1.029709	3 분류 치주질환 중 %	추정값	25.0%	23.0%	24.0%	23.8%
		95% 신뢰구간 하한	23.1%	21.7%	22.6%	22.9%
		상한	26.9%	24.3%	25.5%	24.6%
		가중되지 않은 빈도	703	1421	1064	3188
1.029710-1.477	3 분류 치주질환 중 %	추정값	26.4%	27.2%	25.2%	26.4%
		95% 신뢰구간 하한	24.5%	25.8%	23.6%	25.5%
		상한	28.3%	28.7%	26.7%	27.4%
		가중되지 않은 빈도	720	1506	962	3188
1.477-	3 분류 치주질환 중 %	추정값	31.6%	28.6%	26.8%	28.8%
		95% 신뢰구간 하한	29.5%	27.1%	25.1%	27.7%
		상한	33.7%	30.1%	28.7%	29.9%
		가중되지 않은 빈도	782	1449	956	3187
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%
		95% 신뢰구간 하한	100.0%	100.0%	100.0%	100.0%
		상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	92.202 ^a	6	.000
	Likelihood Ratio	92.857	6	.000
	Linear-by-Linear Association	78.325	1	.000
	N of Valid Cases	12750		

1-1-2-19 Vit B3 by EAR

Vit B3 EAR Intake * 3 분류 치주질환^a

Vit B3 EAR Intake		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
Adequ	3 분류 치주질환 중 %	추정값	68.1%	65.4%	63.4%	65.4%	
		표준오차	1.1%	0.8%	0.9%	0.6%	
		95% 신뢰구간	하한	65.9%	63.8%	61.6%	64.3%
			상한	70.1%	66.9%	65.2%	66.5%
		가중되지 않은 빈도	1821	3644	2520	7985	
Inadequ	3 분류 치주질환 중 %	추정값	27.2%	29.5%	32.5%	29.9%	
		표준오차	1.0%	0.8%	0.9%	0.5%	
		95% 신뢰구간	하한	25.2%	28.1%	30.8%	28.8%
			상한	29.3%	31.0%	34.3%	30.9%
		가중되지 않은 빈도	825	1918	1542	4285	
over UL	3 분류 치주질환 중 %	추정값	4.7%	5.1%	4.1%	4.7%	
		표준오차	0.5%	0.4%	0.4%	0.3%	
		95% 신뢰구간	하한	3.9%	4.4%	3.3%	4.2%
			상한	5.8%	5.9%	5.0%	5.2%
		가중되지 않은 빈도	106	229	145	480	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		표준오차	0.0%	0.0%	0.0%	0.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	35.140 ^a	4	.000
	Likelihood Ratio	35.213	4	.000
	Linear-by-Linear Association	17.896	1	.000
	N of Valid Cases	12750		

1-1-2-20 Vit B3 by Quartile

B3 집단 Quartile 분류 * 3 분류 치주질환^a

B3 집단 Quartile 분류		3 분류 치주질환					
		CPI 0 healthy	CPI 1-2 gingivitis	CPI 3-4 periodontitis	합계		
-10.056	3 분류 치주질환 중 %	추정값	20.2%	21.2%	22.6%	21.4%	
		95% 신뢰구간	하한	18.5%	19.9%	21.1%	20.5%
			상한	21.9%	22.6%	24.2%	22.3%
		가중되지 않은 빈도	631	1439	1117	3187	
10.057-14.0715	3 분류 치주질환 중 %	추정값	24.0%	23.2%	23.0%	23.3%	
		95% 신뢰구간	하한	22.2%	21.9%	21.4%	22.5%
			상한	26.0%	24.5%	24.6%	24.2%
		가중되지 않은 빈도	703	1431	1054	3188	
14.0716-19.7289	3 분류 치주질환 중 %	추정값	25.0%	26.2%	26.1%	25.9%	
		95% 신뢰구간	하한	23.2%	24.8%	24.6%	25.0%
			상한	26.9%	27.5%	27.7%	26.8%
		가중되지 않은 빈도	686	1471	1031	3188	
19.729-	3 분류 치주질환 중 %	추정값	30.8%	29.4%	28.3%	29.4%	
		95% 신뢰구간	하한	28.5%	28.0%	26.5%	28.3%
			상한	33.2%	30.9%	30.2%	30.5%
		가중되지 않은 빈도	732	1450	1005	3187	
합계	3 분류 치주질환 중 %	추정값	100.0%	100.0%	100.0%	100.0%	
		95% 신뢰구간	하한	100.0%	100.0%	100.0%	100.0%
			상한	100.0%	100.0%	100.0%	100.0%
		가중되지 않은 빈도	2752	5791	4207	12750	

a. Niacin 논문 분석집단 변수 = Yes

Chi-Square Tests

Niacin 논문 분석집단 변수		Value	df	Asymp. Sig. (2-sided)
Yes	Pearson Chi-Square	15.035 ^a	6	.020
	Likelihood Ratio	15.060	6	.020
	Linear-by-Linear Association	12.249	1	.000
	N of Valid Cases	12750		

1-2. Raw data by SPSS statistics for Table 2

Table 2 Adjusted associations of dietary vitamin B1, B2, B3 intake (by EAR) with gingivitis (CPI 1-2) by multi-variable logistic regression analysis (N = 8543)

Sample Design Information		
		N
Unweighted Cases	Valid	8543
	Invalid	33344
	Total	41887
Population Size		13182385.14
Subpopulation Size ^a		13182385.14
Stage 1	Strata	50
	Units	828
Sampling Design Degrees of Freedom		778

a. Subpopulation: Niacin 논문 분석집단 변수 = Yes

1-2-1. Crude odds ratios (vitamin B1, B2, B3 by EAR)

1-2-1-1. Crude odds ratios (Gingivitis vs vit B1)

		승산비	95% 신뢰구간	
healthyVSgingivitis			하한	상한
Vit B1 EAR Intake	Inadequ 및 Adequ	1.126	1.008	1.258

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 0 healthy	(Intercept)	-.766	-.879	-.654	.465	.415	.520
	[a_VitB1_EAR_intake=1.0000]	.119	.008	.230	1.126	1.008	1.258
	[a_VitB1_EAR_intake=2.0000]	.000 ^a			1.000		

1-2-1-2. Crude odds ratios (Gingivitis vs vit B2)

healthyVSgingivitis				승산비	95% 신뢰구간	
					하한	상한
Vit B2 EAR Intake	Inadequ 및 Adequ	CPI 1-2 gingivitis		1.180	1.058	1.316

Parameter Estimates							
healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 0 healthy	(Intercept)	-.769	-.873	-.665	.464	.418	.514
	[a_VitB2_EAR_intake=1.00]	.165	.056	.274	1.180	1.058	1.316
	[a_VitB2_EAR_intake=2.00]	.000 ^a	.	.	1.000	.	.

1-2-1-3. Crude odds ratios (Gingivitis vs vit B3)

healthyVSgingivitis				승산비	95% 신뢰구간	
					하한	상한
Vit B3 EAR Intake	Inadequ 및 Adequ	CPI 1-2 gingivitis		1.130	1.000	1.277
	over UL 및 Adequ	CPI 1-2 gingivitis		1.119	.858	1.459

Parameter Estimates							
healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(Intercept)	.647	.556	.737	1.909	1.743	2.090
	[UL_VitB3_EAR_intake=1.00]	.112	-.153	.378	1.119	.858	1.459
	[UL_VitB3_EAR_intake=2.00]	.122	.000	.244	1.130	1.000	1.277
	[UL_VitB3_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.

1-2-1-4. Crude odds ratios (Gingivitis vs vit A)

healthyVSgingivitis 모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
		하한	상한		하한	상한
CPI 1-2 gingivitis (절편)	.648	.553	.744	1.912	1.738	2.104
[ULa_VitA_EAR_intake=1.00]	-.109	-.457	.239	.897	.633	1.270
[ULa_VitA_EAR_intake=2.00]	.109	-.003	.220	1.115	.997	1.247
[ULa_VitA_EAR_intake=3.00]	.000 ^a	1.000

부모집단: Niacin 눈물 분석집단 변수 = Yes

1-2-1-5. Crude odds ratios (Gingivitis vs vit C)

healthyVSgingivitis			증산비	95% 신뢰구간	
				하한	상한
UL vitamin C EAR 분석집단	over UL 및 Adequ	CPI 1-2 gingivitis	3.488E-011	4.962E-012	2.488E-010
	Inadequ 및 Adequ	CPI 1-2 gingivitis	1.144	1.021	1.281

부모집단: Niacin 눈물 분석집단 변수 = Yes

1-2-1-6. Crude odds ratios (Gingivitis vs age)

모수 추정값

healthyVSgingivitis 모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
		하한	상한		하한	상한
CPI 1-2 gingivitis (절편)	.309	.123	.495	1.362	1.131	1.641
age	.010	.006	.014	1.010	1.006	1.014

1-2-1-7. Crude odds ratios (Gingivitis vs sex)

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 0 healthy	(절편)	-.487	-.580	-.394	.615	.560	.674
	[a_sex=1.00]	-.421	-.536	-.306	.656	.585	.736
	[a_sex=2.00]	.000 ^a			1.000		

1-2-1-8. Crude odds ratios (Gingivitis vs income)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	.887	.685	1.090	2.429	1.984	2.974
	[Ra_ho_incm=1.00]	-.336	-.566	-.105	.715	.568	.900
	[Ra_ho_incm=2.00]	-.185	-.402	.032	.831	.669	1.033
	[Ra_ho_incm=3.00]	-.094	-.326	.138	.910	.722	1.148
	[Ra_ho_incm=4.00]	.000 ^a			1.000		

1-2-1-9. Crude odds ratios (Gingivitis vs tooth brushing)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	1.052	.827	1.277	2.862	2.286	3.584
	[Ra_brushing_category=1.00]	-.523	-.753	-.293	.593	.471	.746
	[Ra_brushing_category=2.00]	-.217	-.448	.014	.805	.639	1.014
	[Ra_brushing_category=3.00]	.000 ^a			1.000		

1-2-1-10. Crude odds ratios (Gingivitis vs physical activity)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	.843	.671	1.016	2.324	1.956	2.761
	[Ra_Physical_walking=1.00]	-.186	-.370	-.002	.830	.691	.998
	[Ra_Physical_walking=2.00]	-.157	-.342	.029	.855	.710	1.029
	[Ra_Physical_walking=3.00]	.000 ^a			1.000		

1-2-1-11. Crude odds ratios (Gingivitis vs drinking)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	.634	.533	.735	1.885	1.704	2.085
	[Ra_Drinking_frequency=1.00]	.670	.385	.955	1.954	1.470	2.598
	[Ra_Drinking_frequency=2.00]	.146	-.022	.314	1.157	.978	1.368
	[Ra_Drinking_frequency=3.00]	-.015	-.139	.109	.985	.870	1.115
	[Ra_Drinking_frequency=4.00]	.000 ^a			1.000		

1-2-1-12. Crude odds ratios (Gingivitis vs smoking)

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(Intercept)	.533	.440	.627	1.704	1.552	1.871
	[Ra_cigarette_smoking=1.00]	.383	.264	.503	1.467	1.302	1.653
	[Ra_cigarette_smoking=2.00]	.005	-.295	.306	1.005	.744	1.358
	[Ra_cigarette_smoking=3.00]	.000 ^a			1.000		

1-2-1-13. Crude odds ratios (Gingivitis vs diabetes)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	.632	.543	.721	1.881	1.721	2.057
	[Ra_HE_DM=1.00]	.505	.256	.754	1.657	1.292	2.124
	[Ra_HE_DM=2.00]	.238	.078	.399	1.269	1.081	1.490
	[Ra_HE_DM=3.00]	.000 ^a			1.000		

1-2-1-14. Crude odds ratios (Gingivitis vs hypercholesterolemia)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	.672	.586	.757	1.958	1.797	2.132
	[Ra_HE_hCHOL=1.00]	.201	-.021	.422	1.222	.979	1.525
	[Ra_HE_hCHOL=2.00]	.000 ^a			1.000		

1-2-1-15. Crude odds ratios (Gingivitis vs hypertension)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	.550	.452	.649	1.734	1.571	1.913
	[Ra_HE_hp=1.00]	.412	.260	.563	1.509	1.297	1.757
	[Ra_HE_hp=2.00]	.266	.128	.404	1.305	1.137	1.498
	[Ra_HE_hp=3.00]	.000 ^a			1.000		

1-2-1-16. Crude odds ratios (Gingivitis vs obesity)

모수 추정값

healthyVSgingivitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 1-2 gingivitis	(절편)	.636	.544	.727	1.888	1.724	2.068
	[Ra_HE_obe=1.00]	.248	.124	.371	1.281	1.132	1.449
	[Ra_HE_obe=2.00]	-.299	-.527	-.071	.742	.591	.932
	[Ra_HE_obe=3.00]	.000 ^a			1.000		

1-2-2. Adjusted odds ratios (Gingivitis vs vit B1, B2, B3 by EAR)

표본 계획 정보

		N
가중되지 않은 케이스	유효	8543
	유효하지 않음	4207
	합계	12750
모집단 크기		13182385.14
부모집단 크기 ^a		13182385.14
단계 1	계층변수	50
	단위	828
표본추출 계획 자유도		778

a. 부모집단: Niacin 논문 분석집단 변수 = Yes

1-2-2-1. Adjusted odds ratios (Gingivitis vs vit B1)

			승산비	95% 신뢰구간	
healthyVSgingivitis				하한	상한
Vit B1 EAR Intake	Inadequ 및 Adequ	CPI 1-2 gingivitis	1.124	.992	1.274

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(공백)	.858	.427	1.290	2.360	1.533	3.632
	[ULa_VitA_EAR_intake=1.00]	-.107	-.458	.243	.898	.633	1.275
	[ULa_VitA_EAR_intake=2.00]	.024	-.101	.149	1.024	.904	1.160
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.766	-25.793	-21.739	4.780E-011	6.382E-012	3.622E-010
	[ULa_VitC_EAR_intake=2.00]	.101	-.025	.228	1.107	.975	1.257
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.294	-.454	-.133	.745	.635	.875
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.173	-.416	.069	.841	.660	1.071
	[Ra_ho_incm=2.00]	-.043	-.268	.183	.958	.765	1.200
	[Ra_ho_incm=3.00]	-.002	-.241	.236	.998	.786	1.267
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.309	-.546	-.072	.734	.579	.931
	[Ra_brushing_category=2.00]	-.088	-.322	.146	.916	.725	1.157
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.130	-.317	.057	.878	.728	1.059
	[Ra_Physical_walking=2.00]	-.078	-.267	.111	.925	.765	1.118
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.336	.037	.635	1.399	1.038	1.886
	[Ra_Drinking_frequency=2.00]	-.028	-.210	.155	.973	.810	1.168
	[Ra_Drinking_frequency=3.00]	-.068	-.197	.061	.934	.821	1.063
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.112	-.046	.270	1.119	.955	1.310
	[Ra_Lifetime_smoking=2.00]	-.054	-.357	.249	.947	.700	1.282
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.237	-.041	.516	1.268	.960	1.675
	[Ra_HE_DM=2.00]	.072	-.099	.244	1.075	.906	1.276
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hCHOL=1.00]	.044	-.190	.278	1.045	.827	1.320
	[Ra_HE_hCHOL=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.111	-.071	.293	1.117	.931	1.340
	[Ra_HE_hp=2.00]	.108	-.042	.258	1.114	.959	1.294
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.086	-.046	.218	1.090	.955	1.244
	[Ra_HE_obe=2.00]	-.181	-.414	.053	.835	.661	1.054
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B1=Inadequ / Adequ	.117	-.007	.242	1.124	.992	1.274
	Vit B1=Adequ	.000 ^a	.	.	1.000	.	.
	age	.004	-.001	.009	1.004	.999	1.009

1-2-2-2. Adjusted odds ratios (Gingivitis vs vit B2)

healthyVSgingivitis				승산비	95% 신뢰구간		
					하한	상한	
Vit B2 EAR Intake	Inadequ	및	Adequ	CPI 1-2 gingivitis	1.077	.949	1.223

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(기본)	.842	.409	1.274	2.320	1.506	3.576
	[ULa_VitA_EAR_intake=1.00]	-.100	-.453	.254	.905	.636	1.289
	[ULa_VitA_EAR_intake=2.00]	.023	-.106	.152	1.023	.900	1.165
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.773	-25.800	-21.746	4.748E-011	6.342E-012	3.597E-010
	[ULa_VitC_EAR_intake=2.00]	.120	-.005	.246	1.128	.995	1.279
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.275	-.435	-.114	.760	.647	.892
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incM=1.00]	-.174	-.417	.069	.840	.659	1.071
	[Ra_ho_incM=2.00]	-.046	-.271	.179	.955	.763	1.196
	[Ra_ho_incM=3.00]	-.005	-.244	.234	.995	.784	1.264
	[Ra_ho_incM=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.308	-.545	-.071	.735	.580	.931
	[Ra_brushing_category=2.00]	-.088	-.322	.146	.916	.725	1.157
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.132	-.320	.055	.876	.726	1.056
	[Ra_Physical_walking=2.00]	-.081	-.270	.108	.922	.763	1.114
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.336	.037	.635	1.399	1.038	1.886
	[Ra_Drinking_frequency=2.00]	-.026	-.209	.157	.974	.812	1.169
	[Ra_Drinking_frequency=3.00]	-.070	-.199	.059	.932	.819	1.061
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.115	-.043	.273	1.122	.958	1.314
	[Ra_Lifetime_smoking=2.00]	-.047	-.350	.256	.954	.704	1.292
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.238	-.041	.516	1.268	.960	1.676
	[Ra_HE_DM=2.00]	.070	-.101	.241	1.072	.904	1.272
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hCHOL=1.00]	.043	-.191	.277	1.044	.826	1.319
	[Ra_HE_hCHOL=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.109	-.073	.291	1.115	.930	1.338
	[Ra_HE_hp=2.00]	.109	-.041	.258	1.115	.960	1.295
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.087	-.044	.219	1.091	.956	1.245
	[Ra_HE_obe=2.00]	-.176	-.410	.058	.839	.664	1.060
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B2=Inadequ / Adequ	.075	-.052	.202	1.077	.949	1.223
	Vit B2=Adequ	.000 ^a	.	.	1.000	.	.
	age	.004	-.001	.009	1.004	.999	1.009

Subpopulation: Niacin 논문 분석집단 변수 = Yes

1-2-2-3. Adjusted odds ratios (Gingivitis vs vit B3)

healthyVSgingivitis			승산비	95% 신뢰구간	
				하한	상한
Vit B3 EAR Intake	Inadequ 및 Adequ	CPI 1-2 gingivitis	1.124	.978	1.290
	over UL 및 Adequ	CPI 1-2 gingivitis	1.023	.772	1.355

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(절편)	.842	.410	1.274	2.320	1.506	3.575
	[ULa_VitA_EAR_intake=1.00]	-.112	-.465	.241	.894	.628	1.272
	[ULa_VitA_EAR_intake=2.00]	.028	-.098	.154	1.028	.907	1.166
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.790	-25.833	-21.747	4.668E-011	6.139E-012	3.594E-010
	[ULa_VitC_EAR_intake=2.00]	.110	-.017	.238	1.117	.983	1.269
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.294	-.455	-.132	.746	.635	.876
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_inc=1.00]	-.167	-.410	.075	.846	.664	1.078
	[Ra_ho_inc=2.00]	-.040	-.265	.186	.961	.767	1.204
	[Ra_ho_inc=3.00]	-.001	-.240	.237	.999	.787	1.268
	[Ra_ho_inc=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.303	-.540	-.067	.738	.583	.936
	[Ra_brushing_category=2.00]	-.084	-.318	.150	.920	.728	1.162
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.131	-.319	.056	.877	.727	1.058
	[Ra_Physical_walking=2.00]	-.079	-.269	.111	.924	.764	1.117
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.335	.035	.635	1.398	1.036	1.887
	[Ra_Drinking_frequency=2.00]	-.024	-.207	.160	.977	.813	1.173
	[Ra_Drinking_frequency=3.00]	-.066	-.196	.063	.936	.822	1.065
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.113	-.045	.271	1.119	.956	1.311
	[Ra_Lifetime_smoking=2.00]	-.056	-.359	.248	.946	.698	1.281
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.235	-.044	.514	1.265	.957	1.671
	[Ra_HE_DM=2.00]	.071	-.100	.242	1.073	.905	1.274
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hCHOL=1.00]	.046	-.188	.279	1.047	.829	1.322
	[Ra_HE_hCHOL=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.108	-.074	.290	1.114	.928	1.336
	[Ra_HE_hp=2.00]	.107	-.043	.257	1.113	.958	1.293
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obese=1.00]	.087	-.045	.219	1.091	.956	1.244
	[Ra_HE_obese=2.00]	-.181	-.414	.052	.835	.661	1.054
	[Ra_HE_obese=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B3=over UL / Adequ	.023	-.259	.304	1.023	.772	1.355
	Vit B3=Inadequ / Adequ	.117	-.021	.255	1.124	.978	1.290
	Vit B3=over UL	.000 ^a	.	.	1.000	.	.
	age	.004	-.001	.009	1.004	.999	1.009

1-3. Raw data by SPSS statistics for Table 3

Table 3 Adjusted associations of dietary vitamin B₁, vitamin B₂, and vitamin B₃ intake (by EAR) with periodontitis (CPI 3-4) by multi-variable logistic regression analysis (N=6959)

Sample Design Information		
		N
Unweighted Cases	Valid	6959
	Invalid	5791
	Total	12750
Population Size		10040145.58
Subpopulation Size ^a		10040145.58
Stage 1	Strata	50
	Units	821
Sampling Design Degrees of Freedom		771

a. Subpopulation: Niacin 논문 분석집단 변수 = Yes

1-3-1. Crude odds ratios (Periodontitis vs vit B1, B2, B3 by EAR)

1-3-1-1. Crude odds ratios (Periodontitis vs vit B1)

			승산비	95% 신뢰구간	
healthyVPeriodontitis				하한	상한
Vit B1 EAR Intake	Inadequ 및 Adequ	CPI 3-4 periodontitis	1.258	1.117	1.416

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 0 healthy	(Intercept)	-.394	-.508	-.280	.674	.602	.755
	[a_VitB1_EAR_intake=1.0000]	.229	.111	.348	1.258	1.117	1.416
	[a_VitB1_EAR_intake=2.0000]	.000 ^a	.	.	1.000	.	.

1-3-1-2. Crude odds ratios (Periodontitis vs vit B2)

			승산비	95% 신뢰구간	
healthyVPeriodontitis				하한	상한
Vit B2 EAR Intake	Inadequ 및 Adequ	CPI 3-4 periodontitis	1.521	1.343	1.722

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 0 healthy	(Intercept)	-.438	-.543	-.332	.646	.581	.717
	[a_VitB2_EAR_Intake=1.00]	.419	.295	.543	1.521	1.343	1.722
	[a_VitB2_EAR_Intake=2.00]	.000 ^a	.	.	1.000	.	.

1-3-1-3. Crude odds ratios (Periodontitis vs vit B3)

			승산비	95% 신뢰구간	
healthyVPeriodontitis				하한	상한
Vit B3 EAR Intake	Inadequ 및 Adequ	CPI 3-4 periodontitis	1.281	1.133	1.450
	over UL 및 Adequ	CPI 3-4 periodontitis	.920	.676	1.252

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(Intercept)	.173	.079	.267	1.189	1.082	1.306
	[UL_VitB3_EAR_intake=1.00]	-.084	-.391	.224	.920	.676	1.252
	[UL_VitB3_EAR_intake=2.00]	.248	.125	.371	1.281	1.133	1.450
	[UL_VitB3_EAR_intake=3.00]	.000 ^a			1.000		

1-3-1-4. Crude odds ratios (Periodontitis vs vit A)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	.154	.056	.252	1.166	1.057	1.287
	[ULa_VitA_EAR_intake=1.00]	.063	-.269	.396	1.065	.764	1.486
	[ULa_VitA_EAR_intake=2.00]	.224	.110	.338	1.252	1.117	1.403
	[ULa_VitA_EAR_intake=3.00]	.000 ^a			1.000		

1-3-1-5. Crude odds ratios (Periodontitis vs vit C)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	.186	.084	.287	1.204	1.088	1.332
	[ULa_VitC_EAR_intake=1.00]	-23.414	-25.382	-21.447	6.790E-011	9.576E-012	4.852E-010
	[ULa_VitC_EAR_intake=2.00]	.135	.014	.256	1.144	1.014	1.292
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.

1-3-1-6. Crude odds ratios (Periodontitis vs age)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	-2.929	-3.182	-2.676	.053	.041	.069
	age	.073	.067	.078	1.075	1.070	1.081

부모집단: Niacin 논문 분석집단 변수 = Yes

1-3-1-7. Crude odds ratios (Periodontitis vs sex)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	.672	.559	.786	1.959	1.748	2.195
	[Ra_sex=1.00]	-.928	-1.051	-.805	.395	.349	.447
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.

1-3-1-8. Crude odds ratios (Periodontitis vs monthly income)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	.844	.647	1.040	2.325	1.909	2.831
	[Ra_ho_incm=1.00]	-.964	-1.189	-.739	.381	.304	.477
	[Ra_ho_incm=2.00]	-.620	-.837	-.404	.538	.433	.668
	[Ra_ho_incm=3.00]	-.392	-.618	-.167	.675	.539	.846
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.

1-3-1-9. Crude odds ratios (Periodontitis vs tooth brushing)

			healthyVPeriodontitis	승산비	95% 신뢰구간	
					하한	상한
역 하루치솔질 횟수	thrice or more/day 및 once or no/day	CPI 3-4 periodontitis	.322	.256	.404	
	twice/day 및 once or no/day	CPI 3-4 periodontitis	.606	.483	.760	

1-3-1-10. Crude odds ratios (Periodontitis vs physical activity)

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	.484	.301	.668	1.623	1.351	1.950
	[Ra_Physical_walking=1.00]	-.299	-.496	-.101	.742	.609	.904
	[Ra_Physical_walking=2.00]	-.229	-.426	-.033	.795	.653	.968
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.

1-3-1-11. Crude odds ratios (Periodontitis vs drinking)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	.107	.000	.213	1.113	1.000	1.238
	[Ra_Drinking_frequency=1.00]	1.453	1.179	1.727	4.276	3.251	5.625
	[Ra_Drinking_frequency=2.00]	.340	.162	.517	1.405	1.176	1.677
	[Ra_Drinking_frequency=3.00]	-.116	-.258	.025	.890	.773	1.026
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.

1-3-1-12. Crude odds ratios (Periodontitis vs smoking)

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(Intercept)	-.235	-.341	-.130	.790	.711	.878
	[Ra_cigarette_smoking=1.00]	1.013	.885	1.140	2.753	2.424	3.127
	[Ra_cigarette_smoking=2.00]	-.222	-.592	.147	.801	.553	1.159
	[Ra_cigarette_smoking=3.00]	.000 ^a	.	.	1.000	.	.

1-3-1-13. Crude odds ratios (Periodontitis vs diabetes)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(절편)	-.021	-.114	.073	.979	.892	1.075
	[Ra_HE_DM=1.00]	1.554	1.324	1.783	4.728	3.757	5.950
	[Ra_HE_DM=2.00]	.869	.705	1.033	2.384	2.024	2.809
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.

1-3-1-14. Crude odds ratio
(Periodontitis vs hypercholesterolemia)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(꺾편)	.183	.094	.272	1.201	1.099	1.312
	[Ra_HE_hCHOL=1.00]	.646	.443	.850	1.909	1.558	2.339
	[Ra_HE_hCHOL=2.00]	.000 ^a			1.000		

1-3-1-15. Crude odds ratios (Periodontitis vs hypertension)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(꺾편)	-.214	-.323	-.105	.808	.724	.901
	[Ra_HE_hp=1.00]	1.252	1.099	1.405	3.497	3.001	4.074
	[Ra_HE_hp=2.00]	.637	.488	.786	1.891	1.629	2.194
	[Ra_HE_hp=3.00]	.000 ^a			1.000		

1-3-1-16. Crude odds ratios (Periodontitis vs obesity)

모수 추정값

healthyVPeriodontitis	모수	B	95% 신뢰구간		Exp(B)	Exp(B)에 대한 95% 신뢰구간	
			하한	상한		하한	상한
CPI 3-4 periodontitis	(꺾편)	.120	.025	.215	1.128	1.025	1.240
	[Ra_HE_obe=1.00]	.503	.373	.632	1.654	1.453	1.882
	[Ra_HE_obe=2.00]	-.638	-.907	-.369	.528	.404	.692
	[Ra_HE_obe=3.00]	.000 ^a			1.000		

1-3-2. Adjusted odds ratios (Periodontitis vs vitamin B1, B2, B3 by EAR)

표본 계획 정보

		N
가중되지 않은 케이스	유효	6959
	유효하지 않음	5791
	합계	12750
모집단 크기		10040145.58
부모집단 크기 ^a		10040145.58
단계 1	계층변수	50
	단위	821
표본추출 계획 자유도		771

a. 부모집단: Niacin 논문 분석집단 변수 = Yes

1-3-2-1. Adjusted odds ratios (Periodontitis vs vit B1)

		승산비	95% 신뢰구간		
healthyVPeriodontitis			하한	상한	
Vit B1 EAR Intake	Inadequ 및 Adequ	CPI 3-4 periodontitis	1.134	.977	1.317

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(절편)	-2.567	-3.093	-2.042	.077	.045	.130
	[ULa_VitA_EAR_intake=1.00]	.071	-.301	.442	1.073	.740	1.556
	[ULa_VitA_EAR_intake=2.00]	.086	-.055	.227	1.090	.947	1.255
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-24.070	-26.094	-22.046	3.529E-011	4.749E-012	2.665E-010
	[ULa_VitC_EAR_intake=2.00]	.156	.010	.302	1.168	1.010	1.352
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.477	-.675	-.279	.621	.509	.757
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.271	-.532	-.011	.762	.587	.989
	[Ra_ho_incm=2.00]	.071	-.181	.322	1.073	.835	1.379
	[Ra_ho_incm=3.00]	.164	-.081	.409	1.178	.922	1.506
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.398	-.651	-.145	.672	.522	.865
	[Ra_brushing_category=2.00]	-.125	-.371	.120	.882	.690	1.128
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.119	-.342	.104	.888	.711	1.110
	[Ra_Physical_walking=2.00]	-.017	-.239	.205	.983	.787	1.227
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.643	.333	.953	1.903	1.396	2.595
	[Ra_Drinking_frequency=2.00]	.091	-.110	.292	1.095	.896	1.339
	[Ra_Drinking_frequency=3.00]	.021	-.150	.191	1.021	.861	1.211
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.482	.285	.680	1.620	1.329	1.973
	[Ra_Lifetime_smoking=2.00]	-.085	-.488	.317	.918	.614	1.373
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.496	.222	.769	1.641	1.249	2.158
	[Ra_HE_DM=2.00]	.130	-.061	.322	1.139	.941	1.380
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hCHOL=1.00]	.017	-.204	.239	1.018	.816	1.269
	[Ra_HE_hCHOL=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.070	-.275	.136	.933	.759	1.145
	[Ra_HE_hp=2.00]	.025	-.148	.198	1.025	.862	1.219
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.168	.009	.326	1.183	1.009	1.386
	[Ra_HE_obe=2.00]	-.095	-.417	.226	.909	.659	1.254
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B1=Inadequ / Adequ	.126	-.024	.275	1.134	.977	1.317
	Vit B1=Adequ	.000 ^a	.	.	1.000	.	.
	age	.065	.058	.072	1.067	1.060	1.074

Subpopulation: Niacin 복용 빈도 집단 변수 = Yes

1-3-2-2. Adjusted odds ratios (Periodontitis vs vit B2)

			승산비	95% 신뢰구간	
healthyVPeriodontitis				하한	상한
Vit B2 EAR Intake	Inadequ 및 Adequ	CPI 3-4 periodontitis	1.108	.951	1.291

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(결과)	-2.592	-3.120	-2.064	.075	.044	.127
	[ULa_VitA_EAR_intake=1.00]	.085	-.288	.457	1.089	.750	1.580
	[ULa_VitA_EAR_intake=2.00]	.077	-.068	.221	1.080	.934	1.247
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-24.074	-26.099	-22.049	3.517E-011	4.729E-012	2.658E-010
	[ULa_VitC_EAR_intake=2.00]	.173	.032	.314	1.188	1.032	1.368
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.455	-.654	-.255	.635	.520	.775
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.270	-.531	-.010	.763	.588	.990
	[Ra_ho_incm=2.00]	.069	-.183	.321	1.072	.833	1.379
	[Ra_ho_incm=3.00]	.164	-.082	.409	1.178	.922	1.505
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.395	-.648	-.142	.674	.523	.867
	[Ra_brushing_category=2.00]	-.124	-.369	.122	.883	.691	1.129
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.124	-.347	.099	.884	.707	1.105
	[Ra_Physical_walking=2.00]	-.021	-.243	.201	.979	.785	1.223
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.647	.336	.958	1.910	1.400	2.606
	[Ra_Drinking_frequency=2.00]	.096	-.105	.296	1.101	.901	1.345
	[Ra_Drinking_frequency=3.00]	.022	-.148	.192	1.022	.862	1.212
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.485	.287	.684	1.625	1.333	1.981
	[Ra_Lifetime_smoking=2.00]	-.082	-.487	.322	.921	.615	1.380
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.498	.225	.771	1.645	1.252	2.163
	[Ra_HE_DM=2.00]	.128	-.063	.320	1.137	.939	1.377
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hCHOL=1.00]	.021	-.200	.242	1.022	.819	1.274
	[Ra_HE_hCHOL=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.069	-.275	.137	.933	.759	1.146
	[Ra_HE_hp=2.00]	.026	-.147	.199	1.027	.863	1.221
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.166	.008	.325	1.181	1.008	1.384
	[Ra_HE_obe=2.00]	-.091	-.413	.231	.913	.662	1.260
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B2=Inadequ / Adequ	.103	-.050	.256	1.108	.951	1.291
	Vit B2=Adequ	.000 ^a	.	.	1.000	.	.
	age	.065	.058	.072	1.067	1.060	1.074

1-3-2-3. Adjusted odds ratios (Periodontitis vs vit B3)

		승산비	95% 신뢰구간	
			하한	상한
healthyVPeriodontitis	CPI 3-4 periodontitis	1.251	1.069	1.464
Vit B3 EAR Intake	Inadequ 및 Adequ over UL 및 Adequ	.769	.539	1.096

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis (치주염)		-2.560	-3.086	-2.033	.077	.046	.131
	[ULa_VitA_EAR_intake=1.00]	.104	-.272	.479	1.109	.762	1.615
	[ULa_VitA_EAR_intake=2.00]	.065	-.074	.205	1.068	.928	1.228
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.839	-25.885	-21.793	4.444E-011	5.832E-012	3.432E-010
	[ULa_VitC_EAR_intake=2.00]	.135	-.012	.282	1.145	.988	1.326
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.503	-.702	-.305	.605	.496	.737
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.258	-.519	.003	.773	.595	1.003
	[Ra_ho_incm=2.00]	.085	-.168	.337	1.089	.846	1.401
	[Ra_ho_incm=3.00]	.167	-.079	.414	1.182	.924	1.512
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.390	-.643	-.137	.677	.526	.872
	[Ra_brushing_category=2.00]	-.122	-.368	.124	.885	.692	1.132
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.128	-.351	.095	.880	.704	1.099
	[Ra_Physical_walking=2.00]	-.023	-.245	.199	.977	.783	1.220
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.655	.344	.967	1.926	1.411	2.629
	[Ra_Drinking_frequency=2.00]	.098	-.103	.299	1.103	.902	1.349
	[Ra_Drinking_frequency=3.00]	.028	-.144	.199	1.028	.866	1.220
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.486	.288	.685	1.626	1.333	1.983
	[Ra_Lifetime_smoking=2.00]	-.105	-.507	.297	.900	.602	1.346
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.486	.212	.761	1.627	1.236	2.140
	[Ra_HE_DM=2.00]	.129	-.063	.320	1.137	.939	1.377
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hCHOL=1.00]	.015	-.206	.235	1.015	.814	1.265
	[Ra_HE_hCHOL=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.067	-.273	.139	.935	.761	1.149
	[Ra_HE_hp=2.00]	.024	-.149	.197	1.025	.862	1.218
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	-.172	.014	.331	1.188	1.014	1.392
	[Ra_HE_obe=2.00]	-.099	-.420	.222	.905	.657	1.248
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B3= UL / Adequ	-.263	-.617	.092	.769	.539	1.096
	Vit B3=Inadequ / Adequ	.224	.066	.381	1.251	1.069	1.464
	Vit B3=over UL	.000 ^a	.	.	1.000	.	.
	age	.065	.058	.072	1.067	1.060	1.074

Subpopulation: Niacin 눈은 분석집단 변수 = Yes

1-4. Raw data by SPSS statistics for Table 4

Table 4 Stratified association of age and sex, dyslipidemia and total energy intake of dietary vitamin B₃ intake with periodontitis (CPI 3-4) by EAR (N=6959)

1-4-1. Stratification by age category

1-4-1-1. Stratification by age 19-39 years (N=2093)

			healthyVPeriodontitis	승산비	95% 신뢰구간	
					하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	CPI 3-4 periodontitis	.714	.392	1.300	
	Inadequ 및 adequate	CPI 3-4 periodontitis	1.390	1.044	1.849	

부모집단: Age EAR 3category = 19-39

표본 계획 정보

		N
가중되지 않은 케이스	유효	2093
	유효하지 않음	2616
	합계	4709
모집단 크기		3847269.914
부모집단 크기 ^a		3847269.914
단계 1	계층변수	49
	단위	620
표본추출 계획 자유도		571

a. 부모집단: Age EAR 3category = 19-39

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis (고령)		-4.078	-5.276	-2.881	.017	.005	.056
	[ULa_VitA_EAR_intake=1.00]	-.119	-.881	.644	.888	.414	1.905
	[ULa_VitA_EAR_intake=2.00]	.062	-.196	.319	1.064	.822	1.376
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=2.00]	.271	-.002	.544	1.311	.998	1.723
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.639	-.982	-.295	.528	.374	.744
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.735	-1.225	-.244	.480	.294	.784
	[Ra_ho_incm=2.00]	-.390	-.861	.081	.677	.423	1.085
	[Ra_ho_incm=3.00]	-.271	-.739	.196	.762	.478	1.217
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.706	-1.170	-.242	.494	.310	.785
	[Ra_brushing_category=2.00]	-.482	-.945	-.019	.618	.389	.982
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.266	-.693	.162	.767	.500	1.175
	[Ra_Physical_walking=2.00]	-.156	-.565	.253	.855	.568	1.287
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.650	.031	1.269	1.915	1.031	3.556
	[Ra_Drinking_frequency=2.00]	-.051	-.405	.304	.951	.667	1.355
	[Ra_Drinking_frequency=3.00]	.063	-.228	.354	1.065	.796	1.425
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.413	.070	.757	1.512	1.072	2.132
	[Ra_Lifetime_smoking=2.00]	-.198	-.940	.545	.821	.391	1.724
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	1.116	.398	1.835	3.054	1.489	6.266
	[Ra_HE_DM=2.00]	.368	-.033	.769	1.445	.968	2.158
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.141	-.631	.349	.869	.532	1.418
	[Ra_HE_hp=2.00]	.008	-.307	.324	1.008	.736	1.382
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.022	-.285	.328	1.022	.752	1.388
	[Ra_HE_obe=2.00]	-.043	-.518	.431	.958	.596	1.540
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_it=1.00]	.357	-.473	1.188	1.430	.623	3.279
	[Ra_DI2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vir B3 intake=over UL / Adequ	-.337	-.938	.263	.714	.392	1.300
	Vit B3 intake=Inadequ / Adequ	.329	.043	.615	1.390	1.044	1.849
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	.136	.110	.162	1.145	1.116	1.175

Subpopulation: Age EAR 3category = 19-39

1-4-1-2. Stratification by age 40-59 years (N=2924)

				승산비	95% 신뢰구간	
healthyVPeriodontitis					하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	CPI 3-4 periodontitis		.814	.483	1.373
	Inadequ 및 adequate	CPI 3-4 periodontitis		1.590	1.232	2.052

부모집단: Age EAR 3category = 40-59

표본 계획 정보

		N
가중되지 않은 케이스	유효	2924
	유효하지 않음	2126
	합계	5050
모집단 크기		4553370.291
부모집단 크기 ^a		4553370.291
단계 1	계층변수	49
	단위	714
표본추출 계획 자유도		665

a. 부모집단: Age EAR 3category = 40-59

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis (齒齦)		-1.802	-2.975	-.629	.165	.051	.533
	[ULa_VitA_EAR_intake=1.00]	.245	-.332	.822	1.278	.718	2.276
	[ULa_VitA_EAR_intake=2.00]	.058	-.165	.281	1.060	.848	1.324
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=2.00]	.254	.032	.477	1.290	1.033	1.611
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.621	-.937	-.306	.537	.392	.737
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.623	-1.019	-.226	.536	.361	.797
	[Ra_ho_incm=2.00]	-.189	-.597	.218	.827	.550	1.244
	[Ra_ho_incm=3.00]	.094	-.321	.509	1.099	.725	1.664
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.352	-.743	.039	.703	.476	1.040
	[Ra_brushing_category=2.00]	-.133	-.502	.236	.876	.605	1.267
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	.104	-.204	.413	1.110	.815	1.511
	[Ra_Physical_walking=2.00]	.147	-.170	.464	1.158	.844	1.590
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.780	.329	1.232	2.182	1.389	3.427
	[Ra_Drinking_frequency=2.00]	.069	-.221	.358	1.071	.802	1.430
	[Ra_Drinking_frequency=3.00]	.069	-.188	.326	1.071	.829	1.385
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.638	.334	.942	1.892	1.396	2.564
	[Ra_Lifetime_smoking=2.00]	.065	-.590	.720	1.067	.555	2.054
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.674	.263	1.086	1.963	1.301	2.961
	[Ra_HE_DM=2.00]	-.078	-.334	.178	.925	.716	1.195
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.009	-.284	.267	.991	.753	1.306
	[Ra_HE_hp=2.00]	-.005	-.263	.253	.995	.769	1.288
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.154	-.071	.378	1.166	.931	1.460
	[Ra_HE_obe=2.00]	.275	-.359	.909	1.316	.698	2.481
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_It=1.00]	-.069	-.428	.290	.934	.652	1.337
	[Ra_DI2_It=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.206	-.729	.317	.814	.483	1.373
	Vit B3 intake=Inadequ / Adequ	.464	.209	.719	1.590	1.232	2.052
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	.054	.036	.073	1.056	1.036	1.076

Subpopulation: Age EAR 3category = 40-59

1-4-1-3. Stratification by age over 60 years (N=1942)

			승산비	95% 신뢰구간	
healthy/Periodontitis				하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	CPI 3-4 periodontitis	.998	.374	2.664
	Inadequ 및 adequate	CPI 3-4 periodontitis	.829	.588	1.168

부모집단: Age EAR 3category = 60-

표본 계획 정보

		N
가중되지 않은 케이스	유효	1942
	유효하지 않음	1049
	합계	2991
모집단 크기		1639505.373
부모집단 크기 ^a		1639505.373
단계 1	계층변수	50
	단위	595
표본추출 계획 자유도		545

a. 부모집단: Age EAR 3category = 60-

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
	[ULa_VitA_EAR_intake=1.00]	.190	-.513	.894	1.210	.599	2.444
	[ULa_VitA_EAR_intake=2.00]	.275	-.022	.573	1.317	.978	1.774
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-24.558	-26.920	-22.195	2.172E-011	2.137E-012	2.295E-010
	[ULa_VitC_EAR_intake=2.00]	-.021	-.366	.324	.979	.693	1.382
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.071	-.486	.345	.932	.615	1.411
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.381	-.851	.089	.683	.427	1.093
	[Ra_ho_incm=2.00]	-.100	-.518	.318	.905	.595	1.375
	[Ra_ho_incm=3.00]	-.259	-.621	.104	.772	.537	1.110
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.418	-.823	-.013	.658	.439	.987
	[Ra_brushing_category=2.00]	-.028	-.408	.352	.972	.665	1.422
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.039	-.459	.380	.961	.632	1.463
	[Ra_Physical_walking=2.00]	-.403	-.846	.040	.669	.429	1.041
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.331	-.208	.869	1.392	.812	2.386
	[Ra_Drinking_frequency=2.00]	.112	-.339	.563	1.118	.712	1.756
	[Ra_Drinking_frequency=3.00]	-.108	-.505	.288	.897	.604	1.334
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.190	-.187	.568	1.209	.829	1.764
	[Ra_Lifetime_smoking=2.00]	.797	-.863	2.457	2.218	.422	11.665
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.128	-.257	.512	1.136	.774	1.668
	[Ra_HE_DM=2.00]	.177	-.161	.514	1.193	.851	1.672
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.239	-.096	.574	1.270	.909	1.775
	[Ra_HE_hp=2.00]	.107	-.280	.495	1.113	.756	1.640
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.105	-.192	.401	1.110	.825	1.494
	[Ra_HE_obe=2.00]	.302	-.560	1.163	1.352	.571	3.201
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_It=1.00]	-.426	-.801	-.051	.653	.449	.950
	[Ra_DI2_It=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.002	-.983	.980	.998	.374	2.664
	Vit B3 intake=Inadequ / Adequ	-.188	-.531	.155	.829	.588	1.168
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	-.007	-.031	.017	.993	.969	1.017

Subpopulation: Age EAR 3category = 60-

1-4-2. Stratification by sex

1-4-2-1. Stratification by males (N=3283)

승산비 13^a

		healthyVPeriodontitis	승산비	95% 신뢰구간	
				하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	CPI 3-4 periodontitis	.758	.507	1.133
	Inadequ 및 adequate	CPI 3-4 periodontitis	1.006	.777	1.301

부모집단: 성별 19 세 이상 EAR 분석집단 = 남자

표본 계획 정보

		N
가중되지 않은 케이스	유효	3283
	유효하지 않음	4937
	합계	8220
모집단 크기		5519794.863
부모집단 크기 ^a		5519794.863
단계 1	계층변수	50
	단위	742
표본추출 계획 자유도		692

a. 부모집단: 성별 19 세 이상 EAR 분석집단 = 남자

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(결편)	-2.129	-2.866	-1.393	.119	.057	.248
	[ULa_VitA_EAR_intake=1.00]	.205	-.308	.717	1.227	.735	2.049
	[ULa_VitA_EAR_intake=2.00]	.091	-.130	.311	1.095	.878	1.365
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=2.00]	.098	-.119	.315	1.103	.888	1.370
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.224	-.594	.146	.799	.552	1.157
	[Ra_ho_incm=2.00]	.085	-.287	.457	1.088	.750	1.579
	[Ra_ho_incm=3.00]	.030	-.334	.393	1.030	.716	1.482
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.504	-.811	-.198	.604	.444	.821
	[Ra_brushing_category=2.00]	-.207	-.508	.093	.813	.602	1.098
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.258	-.581	.065	.773	.559	1.067
	[Ra_Physical_walking=2.00]	.072	-.270	.414	1.074	.763	1.513
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.767	.400	1.134	2.152	1.491	3.107
	[Ra_Drinking_frequency=2.00]	.147	-.113	.406	1.158	.893	1.501
	[Ra_Drinking_frequency=3.00]	.011	-.233	.255	1.011	.792	1.290
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.678	.422	.933	1.969	1.526	2.541
	[Ra_Lifetime_smoking=2.00]	.143	-.435	.722	1.154	.647	2.059
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.813	.410	1.216	2.255	1.507	3.374
	[Ra_HE_DM=2.00]	.081	-.168	.330	1.085	.845	1.392
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.142	-.418	.135	.868	.659	1.144
	[Ra_HE_hp=2.00]	-.042	-.286	.202	.959	.751	1.224
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	-.020	-.237	.198	.980	.789	1.218
	[Ra_HE_obe=2.00]	-.030	-.684	.624	.970	.504	1.867
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_it=1.00]	-.072	-.459	.314	.930	.632	1.369
	[Ra_DI2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.277	-.678	.125	.758	.507	1.133
	Vit B3 intake=Inadequ / Adequ	.006	-.252	.263	1.006	.777	1.301
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	.057	.048	.067	1.059	1.049	1.070

Subpopulation: 성별 19 세 이상 EAR 분석집단 = 남자

1-4-2-2. Stratification by females (N=3676)

			승산비	95% 신뢰구간	
healthy/Periodontitis				하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	CPI 3-4 periodontitis	.623	.335	1.161
	Inadequ 및 adequate	CPI 3-4 periodontitis	1.455	1.186	1.786

부모집단: 성별 19 세 이상 EAR 분석집단 = 여자

표본 계획 정보

		N
가중되지 않은 케이스	유효	3676
	유효하지 않음	6645
	합계	10321
모집단 크기		4520350.715
부모집단 크기 ^a		4520350.715
단계 1	계층 변수	48
	단위	761
표본추출 계획 자유도		713

a. 부모집단: 성별 19 세 이상 EAR 분석집단 = 여자

Parameter Estimates

healthyVPeriodontitis (=1)	Parameter	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)		
		Lower	Upper		Lower	Upper	
		B					
	[ULa_VitA_EAR_intake=1.00]	-.055	-.607	.498	.947	.545	1.645
	[ULa_VitA_EAR_intake=2.00]	.053	-.150	.256	1.055	.861	1.292
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-24.076	-26.255	-21.896	3.510E-011	4.059E-012	3.095E-010
	[ULa_VitC_EAR_intake=2.00]	.163	-.036	.361	1.177	.965	1.435
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.293	-.644	.058	.746	.525	1.059
	[Ra_ho_incm=2.00]	.077	-.252	.406	1.080	.777	1.501
	[Ra_ho_incm=3.00]	.307	-.012	.626	1.359	.988	1.870
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.188	-.598	.222	.829	.550	1.249
	[Ra_brushing_category=2.00]	.003	-.405	.411	1.003	.667	1.508
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	.030	-.286	.346	1.031	.751	1.414
	[Ra_Physical_walking=2.00]	-.083	-.392	.226	.920	.676	1.253
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.372	-.284	1.028	1.451	.753	2.794
	[Ra_Drinking_frequency=2.00]	.040	-.258	.339	1.041	.772	1.403
	[Ra_Drinking_frequency=3.00]	.061	-.167	.290	1.063	.846	1.336
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.277	-.045	.600	1.320	.956	1.822
	[Ra_Lifetime_smoking=2.00]	-.236	-.752	.280	.790	.471	1.323
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.032	-.364	.428	1.033	.695	1.535
	[Ra_HE_DM=2.00]	.223	-.050	.496	1.250	.952	1.642
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.066	-.205	.337	1.068	.814	1.401
	[Ra_HE_hp=2.00]	.071	-.170	.311	1.073	.843	1.365
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.425	.203	.647	1.530	1.224	1.911
	[Ra_HE_obe=2.00]	-.050	-.403	.303	.951	.668	1.354
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_I=1.00]	-.102	-.449	.245	.903	.638	1.278
	[Ra_DI2_I=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.473	-1.095	.149	.623	.335	1.161
	Vit B3 intake=Inadequ / Adequ	.375	.170	.580	1.455	1.186	1.786
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	.070	.061	.079	1.072	1.063	1.082

Subpopulation: 성별 19 세 이상 EAR 분석집단 = 여자

1-4-3. Stratification by dyslipidemia

1-4-3-1. Stratification by dyslipidemia (No) (N=6386)

	healthyVPeriodontitis	승산비	95% 신뢰구간	
			하한	상한
UL 기준 Vit B3 EAR Intake over UL 및 adequate	CPI 3-4 periodontitis	.797	.551	1.152
Inadequ 및 adequate	CPI 3-4 periodontitis	1.254	1.067	1.475

부모집단: 이상지질혈증 EAR 분석집단 = 없음

표본 계획 정보

		N
가중되지 않은 케이스	유효	6386
	유효하지 않음	5412
	합계	11798
모집단 크기		9326045.231
부모집단 크기 ^a		9326045.231
단계 1	계층변수	50
	단위	816
표본추출 계획 자유도		766

a. 부모집단: 이상지질혈증 EAR 분석집단 = 없음

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis (중등)		-2.738	-3.307	-2.170	.065	.037	.114
	[ULa_VitA_EAR_intake=1.00]	.049	-.352	.451	1.051	.703	1.570
	[ULa_VitA_EAR_intake=2.00]	.083	-.066	.232	1.086	.936	1.261
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.847	-25.900	-21.793	4.411E-011	5.746E-012	3.432E-010
	[ULa_VitC_EAR_intake=2.00]	.133	-.016	.282	1.142	.984	1.326
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.513	-.720	-.306	.599	.487	.737
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.231	-.508	.047	.794	.602	1.048
	[Ra_ho_incm=2.00]	.151	-.115	.416	1.163	.891	1.517
	[Ra_ho_incm=3.00]	.212	-.049	.472	1.236	.952	1.604
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.370	-.635	-.105	.691	.530	.901
	[Ra_brushing_category=2.00]	-.105	-.363	.153	.901	.696	1.166
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.159	-.393	.075	.853	.675	1.077
	[Ra_Physical_walking=2.00]	-.048	-.281	.185	.953	.755	1.204
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.600	.281	.919	1.822	1.324	2.506
	[Ra_Drinking_frequency=2.00]	.125	-.088	.339	1.134	.916	1.403
	[Ra_Drinking_frequency=3.00]	.024	-.151	.198	1.024	.860	1.219
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.510	.302	.718	1.665	1.352	2.050
	[Ra_Lifetime_smoking=2.00]	-.058	-.475	.359	.944	.622	1.432
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.466	.155	.778	1.594	1.168	2.176
	[Ra_HE_DM=2.00]	.126	-.073	.325	1.134	.929	1.384
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.063	-.279	.152	.939	.757	1.164
	[Ra_HE_hp=2.00]	-.010	-.191	.170	.990	.826	1.186
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.134	-.034	.302	1.143	.966	1.353
	[Ra_HE_obe=2.00]	-.066	-.393	.261	.936	.675	1.299
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.227	-.596	.142	.797	.551	1.152
	Vit B3 intake=Inadequ / Adequ	.227	.065	.389	1.254	1.067	1.475
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	.069	.061	.076	1.071	1.063	1.079

Subpopulation: 이상지질혈증 EAR 분석집단 = 없음

1-4-3-2. Stratification by dyslipidemia (Yes) (N=573)

			승산비	95% 신뢰구간	
healthy/Periodontitis				하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	CPI 3-4 periodontitis	.647	.224	1.874
	Inadequ 및 adequate	CPI 3-4 periodontitis	1.062	.600	1.882

부모집단: 이상지질혈증 EAR 분석집단 = 이상지질혈증

표본 계획 정보

		N
가중되지 않은 케이스	유효	573
	유효하지 않음	379
	합계	952
모집단 크기		714100.348
부모집단 크기 ^a		714100.348
단계 1	계층변수	48
	단위	364
표본추출 계획 자유도		316

a. 부모집단: 이상지질혈증 EAR 분석집단 = 이상지질혈증

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp(B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(결과)	.769	-1.286	2.824	2.158	.276	16.852
	[ULa_VitA_EAR_intake=1.00]	.982	-.595	2.559	2.669	.551	12.924
	[ULa_VitA_EAR_intake=2.00]	-.084	-.620	.452	.919	.538	1.571
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=2.00]	.238	-.323	.798	1.268	.724	2.221
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.383	-1.130	.364	.682	.323	1.439
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.637	-1.373	.098	.529	.253	1.103
	[Ra_ho_incm=2.00]	-.564	-1.339	.211	.569	.262	1.235
	[Ra_ho_incm=3.00]	-.125	-.862	.612	.883	.423	1.844
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.736	-1.633	.162	.479	.195	1.175
	[Ra_brushing_category=2.00]	-.488	-1.363	.388	.614	.256	1.474
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	.305	-.452	1.062	1.356	.636	2.892
	[Ra_Physical_walking=2.00]	.280	-.521	1.082	1.324	.594	2.949
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	1.383	.213	2.552	3.986	1.238	12.839
	[Ra_Drinking_frequency=2.00]	-.167	-.782	.447	.846	.458	1.564
	[Ra_Drinking_frequency=3.00]	.111	-.521	.742	1.117	.594	2.100
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.014	-.724	.751	1.014	.485	2.120
	[Ra_Lifetime_smoking=2.00]	-1.255	-3.047	.537	.285	.047	1.711
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.858	.215	1.502	2.360	1.239	4.492
	[Ra_HE_DM=2.00]	.320	-.259	.899	1.377	.772	2.457
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.066	-.665	.534	.936	.514	1.705
	[Ra_HE_hp=2.00]	.375	-.282	1.032	1.455	.754	2.807
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.471	-.002	.945	1.602	.998	2.572
	[Ra_HE_obe=2.00]	-1.994	-3.618	-.370	.136	.027	.690
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.435	-1.498	.628	.647	.224	1.874
	Vit B3 intake=Inadequ / Adequ	.061	-.511	.633	1.062	.600	1.882
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	.006	-.019	.032	1.006	.981	1.032

Subpopulation: 이상지질혈증 EAR 분석집단 = 이상지질혈증

1-4-4. Stratification by total energy intake

1-4-4.1. Stratification by total energy intake (over EER) (N=2488)

		건강한 healthyVPeriodontitis	승산비	95% 신뢰구간	
				하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	CPI 3-4 periodontitis	.783	.535	1.148
	inadequ 및 adequate	CPI 3-4 periodontitis	1.079	.609	1.912

부모집단: energy intake EAR 분석집단 = over EER

표본 계획 정보

		N
가중되지 않은 케이스	유효	2488
	유효하지 않음	7447
	합계	9935
모집단 크기		3671377.034
부모집단 크기 ^a		3671377.034
단계 1	계층변수	50
	단위	718
표본추출 계획 자유도		668

a. 부모집단: energy intake EAR 분석집단 = over EER

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
	[ULa_VitA_EAR_intake=1.00]	.046	-.416	.509	1.047	.660	1.663
	[ULa_VitA_EAR_intake=2.00]	.034	-.260	.328	1.035	.771	1.388
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.746	-25.869	-21.623	4.876E-011	5.922E-012	4.068E-010
	[ULa_VitC_EAR_intake=2.00]	.135	-.152	.422	1.145	.859	1.525
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.587	-.930	-.244	.556	.394	.784
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.383	-.794	.027	.682	.452	1.028
	[Ra_ho_incm=2.00]	.110	-.300	.521	1.117	.741	1.683
	[Ra_ho_incm=3.00]	.119	-.308	.545	1.126	.735	1.725
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.499	-.898	-.100	.607	.408	.905
	[Ra_brushing_category=2.00]	-.166	-.565	.232	.847	.568	1.262
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	.022	-.315	.358	1.022	.730	1.431
	[Ra_Physical_walking=2.00]	.121	-.225	.466	1.128	.798	1.594
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.509	.088	.929	1.663	1.092	2.533
	[Ra_Drinking_frequency=2.00]	.052	-.264	.369	1.054	.768	1.447
	[Ra_Drinking_frequency=3.00]	.050	-.222	.322	1.051	.801	1.380
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.482	.140	.824	1.620	1.151	2.280
	[Ra_Lifetime_smoking=2.00]	-.502	-1.122	-.118	.605	.325	1.125
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.439	-.021	.899	1.551	.979	2.456
	[Ra_HE_DM=2.00]	.077	-.251	.405	1.080	.778	1.499
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.222	-.545	.100	.801	.580	1.105
	[Ra_HE_hp=2.00]	.087	-.190	.365	1.091	.827	1.440
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.087	-.167	.341	1.091	.846	1.407
	[Ra_HE_obe=2.00]	-.388	-1.006	.229	.678	.366	1.257
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[a_DI2_lt=1.00]	.088	-.338	.515	1.093	.713	1.674
	[a_DI2_lt=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.244	-.626	.138	.783	.535	1.148
	Vit B3 intake=Inadequ / Adequ	.076	-.496	.648	1.079	.609	1.912
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	.075	.064	.086	1.078	1.066	1.090

Subpopulation: energy intake EAR 분석집단 = over EER

1-4-4-2. Stratification by total energy intake (below EER) (N=4471)

			승산비	95% 신뢰구간	
				하한	상한
UL 기준 Vit B3 EAR Intake	over UL 및 adequate	healthyVPeriodontitis CPI 3-4 periodontitis	.936	.275	3.191
	Inadequ 및 adequate	CPI 3-4 periodontitis	1.243	1.046	1.478

부모집단: energy intake EAR 분석집단 = below EER

표본 계획 정보

		N
가중되지 않은 케이스	유효	4471
	유효하지 않음	13291
	합계	17762
모집단 크기		6368768.544
부모집단 크기 ^a		6368768.544
단계 1	계층변수	50
	단위	761
표본추출 계획 자유도		711

a. 부모집단: energy intake EAR 분석집단 = below EER

Parameter Estimates

healthy/Periodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(출판)	-2.494	-3.215	-1.774	.083	.040	.170
	[ULa_VitA_EAR_intake=1.00]	.242	-.500	.984	1.274	.607	2.675
	[ULa_VitA_EAR_intake=2.00]	.057	-.103	.217	1.059	.902	1.242
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=2.00]	.134	-.031	.299	1.143	.970	1.348
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.434	-.678	-.190	.648	.507	.827
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.198	-.513	.117	.820	.598	1.124
	[Ra_ho_incm=2.00]	.056	-.248	.361	1.058	.780	1.435
	[Ra_ho_incm=3.00]	-.186	-.113	.485	1.204	.893	1.624
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.315	-.616	-.014	.730	.540	.986
	[Ra_brushing_category=2.00]	-.081	-.380	.219	.923	.684	1.245
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.225	-.517	.068	.799	.596	1.070
	[Ra_Physical_walking=2.00]	-.124	-.419	.171	.884	.658	1.186
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.786	.339	1.233	2.195	1.404	3.433
	[Ra_Drinking_frequency=2.00]	.132	-.110	.375	1.141	.895	1.455
	[Ra_Drinking_frequency=3.00]	.019	-.185	.222	1.019	.831	1.249
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.508	.276	.741	1.662	1.317	2.098
	[Ra_Lifetime_smoking=2.00]	-.067	-.432	.566	1.069	.649	1.762
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.522	.170	.875	1.686	1.185	2.398
	[Ra_HE_DM=2.00]	-.196	-.031	.423	1.216	.970	1.526
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.049	-.204	.302	1.050	.815	1.353
	[Ra_HE_hp=2.00]	-.027	-.235	.181	.973	.790	1.199
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.241	.037	.445	1.272	1.037	1.560
	[Ra_HE_obe=2.00]	-.001	-.381	.380	.999	.683	1.462
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[a_DI2_it=1.00]	.056	-.298	.410	1.058	.742	1.507
	[a_DI2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 intake=over UL / Adequ	-.066	-1.292	1.160	.936	.275	3.191
	Vit B3 intake=Inadequ / Adequ	.218	.045	.390	1.243	1.046	1.478
	Vit B3 intake=over UL	.000 ^a	.	.	1.000	.	.
	age	-.060	.052	-.068	1.062	1.054	1.070

Subpopulation: energy intake EAR 분석집단 = below EER

1-5. Raw data by SPSS statistics for Figure 2

Figure 2. Association between vitamin B1, B2, B3 and periodontal status in quartile

1-5-1. Gingivitis (adjusted odds ratios)

표본 계획 정보

		N
가중되지 않은 케이스	유효	8543
	유효하지 않음	4207
	합계	12750
모집단 크기		13182385.14
부모집단 크기 ^a		13182385.14
단계 1	계층변수	50
	단위	828
표본추출 계획 자유도		778

a. 부모집단: Niacin 논문 분석집단 변수 = Yes

1-5-1-1. Adjusted odds ratios (Gingivitis by vit B1)

		승산비	95% 신뢰구간	
			하한	상한
B1 집단 Quartile 분류	-0.774 및 1.555- CPI 1-2 gingivitis	1.100	.911	1.329
	0.774-1.097 및 1.555- CPI 1-2 gingivitis	.936	.794	1.103
	1.097-1.555 및 1.555- CPI 1-2 gingivitis	.918	.785	1.072

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(절편)	.887	.448	1.325	2.427	1.566	3.761
	[ULa_VitA_EAR_intake=1.00]	-.129	-.482	.224	.879	.618	1.251
	[ULa_VitA_EAR_intake=2.00]	.032	-.095	.158	1.032	.910	1.171
	[ULa_VitA_EAR_intake=3.00]	.000 ^a			1.000		
	[ULa_VitC_EAR_intake=1.00]	-23.819	-25.844	-21.794	4.535E-011	6.074E-012	3.429E-010
	[ULa_VitC_EAR_intake=2.00]	.108	-.022	.238	1.114	.978	1.269
	[ULa_VitC_EAR_intake=3.00]	.000 ^a			1.000		
	[Ra_sex=1.00]	-.293	-.456	-.130	.746	.634	.879
	[Ra_sex=2.00]	.000 ^a			1.000		
	[Ra_ho_incm=1.00]	-.170	-.413	.072	.843	.662	1.075
	[Ra_ho_incm=2.00]	-.038	-.264	.187	.963	.768	1.206
	[Ra_ho_incm=3.00]	.000	-.239	.238	1.000	.787	1.269
	[Ra_ho_incm=4.00]	.000 ^a			1.000		
	[Ra_brushing_category=1.00]	-.303	-.540	-.066	.739	.583	.936
	[Ra_brushing_category=2.00]	-.085	-.319	.149	.919	.727	1.161
	[Ra_brushing_category=3.00]	.000 ^a			1.000		
	[Ra_Physical_walking=1.00]	-.129	-.316	.058	.879	.729	1.060
	[Ra_Physical_walking=2.00]	-.076	-.265	.113	.927	.767	1.120
	[Ra_Physical_walking=3.00]	.000 ^a			1.000		
	[Ra_Drinking_frequency=1.00]	.327	.028	.625	1.387	1.029	1.869
	[Ra_Drinking_frequency=2.00]	-.029	-.212	.153	.971	.809	1.165
	[Ra_Drinking_frequency=3.00]	-.069	-.198	.060	.933	.820	1.062
	[Ra_Drinking_frequency=4.00]	.000 ^a			1.000		
	[Ra_Lifetime_smoking=1.00]	.110	-.049	.268	1.116	.953	1.307
	[Ra_Lifetime_smoking=2.00]	-.055	-.358	.247	.946	.699	1.281
	[Ra_Lifetime_smoking=3.00]	.000 ^a			1.000		
	[Ra_HE_DM=1.00]	.249	-.032	.530	1.282	.968	1.698
	[Ra_HE_DM=2.00]	.074	-.098	.245	1.076	.907	1.278
	[Ra_HE_DM=3.00]	.000 ^a			1.000		
	[Ra_HE_hp=1.00]	.110	-.072	.292	1.117	.931	1.340
	[Ra_HE_hp=2.00]	.110	-.041	.260	1.116	.960	1.297
	[Ra_HE_hp=3.00]	.000 ^a			1.000		
	[Ra_HE_obe=1.00]	.087	-.045	.219	1.090	.956	1.244
	[Ra_HE_obe=2.00]	-.177	-.412	.058	.838	.663	1.059
	[Ra_HE_obe=3.00]	.000 ^a			1.000		
	[Ra_DI2_it=1.00]	-.029	-.276	.218	.971	.759	1.243
	[Ra_DI2_it=2.00]	.000 ^a			1.000		
	Q1 / Q4	.096	-.094	.285	1.100	.911	1.329
	Vit B1 quartile=Q2 / Q4	-.067	-.231	.098	.936	.794	1.103
	Vit B1 quartile=Q3 / Q4	-.086	-.242	.070	.918	.785	1.072
	Vit B1 quartile=Q4	.000 ^a			1.000		
	age	.005	.000	.009	1.005	1.000	1.009

1-5-1-2. Adjusted odds ratios (Gingivitis by vit B2)

		healthyVSgingivitis	승산비	95% 신뢰구간	
				하한	상한
B2 집단 Quartile 분류	-0.690 및 1.477-	CPI 1-2 gingivitis	1.464	1.205	1.778
	0.690-1.029709 및 1.477-	CPI 1-2 gingivitis	1.101	.935	1.297
	1.029710-1.477 및 1.477-	CPI 1-2 gingivitis	1.204	1.025	1.414

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(절편)	.808	.376	1.240	2.244	1.457	3.457
	[ULa_VitA_EAR_intake=1.00]	-.053	-.407	.302	.949	.666	1.352
	[ULa_VitA_EAR_intake=2.00]	-.043	-.177	.091	.958	.838	1.095
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.721	-25.746	-21.697	4.998E-011	6.685E-012	3.780E-010
	[ULa_VitC_EAR_intake=2.00]	.077	-.050	.205	1.080	.951	1.227
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.322	-.484	-.161	.724	.616	.852
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.164	-.407	.079	.849	.665	1.082
	[Ra_ho_incm=2.00]	-.035	-.262	.191	.966	.770	1.211
	[Ra_ho_incm=3.00]	-.004	-.243	.235	.996	.784	1.265
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.299	-.535	-.062	.742	.585	.940
	[Ra_brushing_category=2.00]	-.079	-.312	.154	.924	.732	1.167
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.131	-.318	.056	.877	.727	1.057
	[Ra_Physical_walking=2.00]	-.075	-.263	.113	.928	.769	1.120
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.346	.048	.645	1.414	1.049	1.906
	[Ra_Drinking_frequency=2.00]	-.021	-.204	.162	.979	.815	1.176
	[Ra_Drinking_frequency=3.00]	-.067	-.196	.062	.935	.822	1.064
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.115	-.043	.273	1.122	.958	1.314
	[Ra_Lifetime_smoking=2.00]	-.047	-.353	.259	.954	.702	1.296
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.249	-.031	.529	1.283	.969	1.697
	[Ra_HE_DM=2.00]	.070	-.102	.243	1.073	.903	1.275
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.110	-.071	.291	1.116	.931	1.338
	[Ra_HE_hp=2.00]	.107	-.043	.257	1.113	.958	1.293
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.083	-.050	.215	1.086	.952	1.240
	[Ra_HE_obe=2.00]	-.183	-.418	.051	.833	.659	1.053
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_it=1.00]	-.027	-.272	.219	.974	.762	1.245
	[Ra_DI2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B2 quartile=Q1 / Q4	.381	.187	.575	1.464	1.205	1.778
	Vit B2 quartile=Q2 / Q4	.096	-.068	.260	1.101	.935	1.297
	Vit B2 quartile=Q3 / Q4	.185	.025	.346	1.204	1.025	1.414
	Vit B2 quartile=Q4	.000 ^a	.	.	1.000	.	.
	age	.003	-.001	.008	1.003	.999	1.008

1-5-1-3. Adjusted odds ratios (Gingivitis by vit B3)

		healthyVSgingivitis	승산비	95% 신뢰구간	
				하한	상한
B3 집단 Quartile 분류	-10.056 및 19.729-	CPI 1-2 gingivitis	1.203	.990	1.461
	10.057-14.0715 및 19.729-	CPI 1-2 gingivitis	1.094	.914	1.308
	14.0716-19.7289 및 19.729-	CPI 1-2 gingivitis	1.165	.996	1.362

Parameter Estimates

healthyVSgingivitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 1-2 gingivitis	(절편)	.790	.356	1.224	2.203	1.427	3.400
	[ULa_VitA_EAR_intake=1.00]	-.091	-.446	.263	.913	.640	1.301
	[ULa_VitA_EAR_intake=2.00]	.023	-.104	.149	1.023	.901	1.161
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-23.735	-25.761	-21.709	4.931E-011	6.590E-012	3.733E-010
	[ULa_VitC_EAR_intake=2.00]	.104	-.024	.233	1.110	.976	1.262
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.309	-.474	-.143	.734	.622	.867
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.167	-.410	.076	.846	.664	1.079
	[Ra_ho_incm=2.00]	-.042	-.268	.184	.959	.765	1.202
	[Ra_ho_incm=3.00]	-.007	-.246	.232	.993	.782	1.261
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.307	-.544	-.070	.736	.581	.932
	[Ra_brushing_category=2.00]	-.088	-.322	.147	.916	.725	1.158
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.132	-.319	.055	.876	.727	1.057
	[Ra_Physical_walking=2.00]	-.078	-.267	.111	.925	.765	1.117
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.346	.047	.645	1.413	1.048	1.905
	[Ra_Drinking_frequency=2.00]	-.017	-.199	.166	.984	.819	1.181
	[Ra_Drinking_frequency=3.00]	-.063	-.192	.067	.939	.825	1.069
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.116	-.043	.274	1.123	.958	1.315
	[Ra_Lifetime_smoking=2.00]	-.054	-.358	.251	.948	.699	1.285
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.254	-.026	.534	1.289	.974	1.705
	[Ra_HE_DM=2.00]	.076	-.096	.247	1.079	.909	1.280
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	.107	-.074	.288	1.113	.928	1.334
	[Ra_HE_hp=2.00]	.106	-.044	.256	1.112	.957	1.292
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obese=1.00]	.091	-.041	.222	1.095	.960	1.249
	[Ra_HE_obese=2.00]	-.180	-.413	.053	.835	.661	1.055
	[Ra_HE_obese=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_it=1.00]	-.035	-.281	.212	.966	.755	1.236
	[Ra_DI2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 quartile=Q1 / Q4	.185	-.010	.379	1.203	.990	1.461
	Vit B3 quartile=Q2 / Q4	.090	-.090	.269	1.094	.914	1.309
	Vit B3 quartile=Q3 / Q4	.152	-.004	.309	1.165	.996	1.362
	Vit B3 quartile=Q4	.000 ^a	.	.	1.000	.	.
	age	.004	-.001	.009	1.004	.999	1.009

1-5-2. Periodontitis (adjusted odds ratios)

표본 계획 정보

		N
가중되지 않은 케이스	유효	6959
	유효하지 않음	5791
	합계	12750
모집단 크기		10040145.58
부모집단 크기 ^a		10040145.58
단계 1	계층변수	50
	단위	821
표본추출 계획 자유도		771

a. 부모집단: Niacin 논문 분석집단 변수 = Yes

1-5-2-1. Adjusted odds ratios (Periodontitis by vit B1)

		healthyVPeriodontitis	승산비	95% 신뢰구간	
				하한	상한
B1 집단 Quartile 분류	-0.774 및 1.555-	CPI 3-4 periodontitis	1.247	.989	1.572
	0.774-1.097 및 1.555-	CPI 3-4 periodontitis	.986	.810	1.200
	1.097-1.555 및 1.555-	CPI 3-4 periodontitis	1.023	.856	1.223

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(공편)	-2.565	-3.097	-2.033	.077	.045	.131
	[ULa_VitA_EAR_intake=1.00]	.067	-.305	.438	1.069	.737	1.550
	[ULa_VitA_EAR_intake=2.00]	.075	-.068	.218	1.078	.935	1.243
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-24.080	-26.108	-22.053	3.493E-011	4.685E-012	2.647E-010
	[ULa_VitC_EAR_intake=2.00]	.144	-.007	.294	1.154	.993	1.342
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.496	-.697	-.294	.609	.498	.745
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.264	-.525	-.003	.768	.591	.997
	[Ra_ho_incm=2.00]	.079	-.173	.332	1.083	.841	1.393
	[Ra_ho_incm=3.00]	.170	-.077	.417	1.186	.926	1.518
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.398	-.650	-.145	.672	.522	.865
	[Ra_brushing_category=2.00]	-.127	-.373	.119	.881	.689	1.126
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.118	-.342	.105	.888	.710	1.111
	[Ra_Physical_walking=2.00]	-.015	-.237	.207	.985	.789	1.230
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.638	.328	.948	1.892	1.388	2.579
	[Ra_Drinking_frequency=2.00]	.090	-.111	.290	1.094	.895	1.337
	[Ra_Drinking_frequency=3.00]	.020	-.150	.191	1.020	.860	1.211
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.478	.280	.676	1.613	1.323	1.966
	[Ra_Lifetime_smoking=2.00]	-.097	-.501	.306	.907	.606	1.358
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.504	.229	.779	1.655	1.257	2.179
	[Ra_HE_DM=2.00]	.133	-.058	.325	1.143	.944	1.384
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.067	-.273	.138	.935	.761	1.148
	[Ra_HE_hp=2.00]	.022	-.152	.195	1.022	.859	1.216
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.171	.012	.330	1.187	1.012	1.392
	[Ra_HE_obe=2.00]	-.089	-.410	.231	.915	.664	1.260
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Di2_it=1.00]	-.068	-.333	.197	.934	.717	1.218
	[Ra_Di2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B1 quartile=Q1 / Q4	.221	-.011	.452	1.247	.989	1.572
	Vit B1 quartile=Q2 / Q4	-.014	-.210	.182	.986	.810	1.200
	Vit B1 quartile=Q3 / Q4	.023	-.156	.201	1.023	.856	1.223
	Vit B1 quartile =Q4	.000 ^a	.	.	1.000	.	.
	age	.065	.059	.072	1.067	1.060	1.075

1-5-2-2. Adjusted odds ratios (periodontitis by vit B2)

			승산비	95% 신뢰구간	
				하한	상한
B2 집단 Quartile 분류	-0.690 및 1.477-	CPI 3-4 periodontitis	1.518	1.197	1.926
	0.690-1.029709 및 1.477-	CPI 3-4 periodontitis	1.123	.929	1.358
	1.029710-1.477 및 1.477-	CPI 3-4 periodontitis	1.221	1.016	1.468

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(공편)	-2.631	-3.162	-2.099	.072	.042	.123
	[ULa_VitA_EAR_intake=1.00]	.129	-.248	.507	1.138	.780	1.661
	[ULa_VitA_EAR_intake=2.00]	.011	-.142	.163	1.011	.868	1.177
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-24.030	-26.057	-22.003	3.673E-011	4.926E-012	2.781E-010
	[ULa_VitC_EAR_intake=2.00]	.134	-.009	.277	1.143	.991	1.319
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.514	-.716	-.311	.598	.489	.732
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.248	-.509	.014	.780	.601	1.014
	[Ra_ho_incm=2.00]	.092	-.161	.345	1.096	.851	1.412
	[Ra_ho_incm=3.00]	.177	-.071	.425	1.193	.931	1.529
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.393	-.645	-.142	.675	.525	.868
	[Ra_brushing_category=2.00]	-.121	-.365	.124	.886	.694	1.132
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.126	-.349	.097	.882	.705	1.102
	[Ra_Physical_walking=2.00]	-.018	-.240	.204	.982	.787	1.226
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.657	.346	.967	1.928	1.414	2.629
	[Ra_Drinking_frequency=2.00]	.105	-.095	.306	1.111	.909	1.358
	[Ra_Drinking_frequency=3.00]	.025	-.147	.196	1.025	.864	1.216
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.482	.283	.681	1.620	1.328	1.977
	[Ra_Lifetime_smoking=2.00]	-.084	-.487	.319	.919	.614	1.375
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.504	.228	.780	1.655	1.256	2.181
	[Ra_HE_DM=2.00]	.138	-.055	.330	1.147	.947	1.391
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.062	-.268	.144	.940	.765	1.155
	[Ra_HE_hp=2.00]	.029	-.144	.203	1.030	.866	1.225
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obese=1.00]	.167	.008	.327	1.182	1.008	1.386
	[Ra_HE_obese=2.00]	-.098	-.421	.224	.906	.657	1.251
	[Ra_HE_obese=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_it=1.00]	-.060	-.326	.206	.942	.722	1.229
	[Ra_DI2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B2 quartile=Q1 / Q4	.418	.180	.655	1.518	1.197	1.926
	Vit B2 quartile=Q2 / Q4	.116	-.073	.306	1.123	.929	1.358
	Vit B2 quartile=Q3 / Q4	.200	.016	.384	1.221	1.016	1.468
	Vit B2 quartile=Q4	.000 ^a	.	.	1.000	.	.
	age	.064	.058	.071	1.067	1.059	1.074

1-5-2-3. Adjusted odds ratios (periodontitis by vit B3)

			승산비	95% 신뢰구간	
healthyVPeriodontitis				하한	상한
B3 집단 Quartile 분류	-10.056 및 19.729-	CPI 3-4 periodontitis	1.384	1.100	1.741
	10.057-14.0715 및 19.729-	CPI 3-4 periodontitis	1.158	.949	1.413
	14.0716-19.7289 및 19.729-	CPI 3-4 periodontitis	1.181	.990	1.408

Parameter Estimates

healthyVPeriodontitis	Parameter	B	95% Confidence Interval		Exp(B)	95% Confidence Interval for Exp (B)	
			Lower	Upper		Lower	Upper
CPI 3-4 periodontitis	(공편)	-2.680	-3.212	-2.147	.069	.040	.117
	[ULa_VitA_EAR_intake=1.00]	.092	-.280	.465	1.097	.756	1.591
	[ULa_VitA_EAR_intake=2.00]	.059	-.083	.200	1.060	.920	1.222
	[ULa_VitA_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[ULa_VitC_EAR_intake=1.00]	-24.013	-26.041	-21.986	3.735E-011	5.003E-012	2.830E-010
	[ULa_VitC_EAR_intake=2.00]	.139	-.008	.287	1.149	.992	1.332
	[ULa_VitC_EAR_intake=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_sex=1.00]	-.511	-.713	-.308	.600	.490	.735
	[Ra_sex=2.00]	.000 ^a	.	.	1.000	.	.
	[Ra_ho_incm=1.00]	-.252	-.515	.010	.777	.598	1.010
	[Ra_ho_incm=2.00]	.084	-.169	.337	1.088	.845	1.401
	[Ra_ho_incm=3.00]	.171	-.077	.419	1.186	.926	1.521
	[Ra_ho_incm=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_brushing_category=1.00]	-.383	-.636	-.130	.682	.530	.878
	[Ra_brushing_category=2.00]	-.115	-.361	.131	.891	.697	1.140
	[Ra_brushing_category=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Physical_walking=1.00]	-.124	-.345	.097	.884	.709	1.102
	[Ra_Physical_walking=2.00]	-.014	-.235	.206	.986	.790	1.229
	[Ra_Physical_walking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Drinking_frequency=1.00]	.657	.346	.969	1.930	1.413	2.636
	[Ra_Drinking_frequency=2.00]	.105	-.095	.306	1.111	.909	1.358
	[Ra_Drinking_frequency=3.00]	.033	-.139	.205	1.034	.870	1.228
	[Ra_Drinking_frequency=4.00]	.000 ^a	.	.	1.000	.	.
	[Ra_Lifetime_smoking=1.00]	.495	.296	.693	1.640	1.345	2.000
	[Ra_Lifetime_smoking=2.00]	-.102	-.504	.301	.903	.604	1.351
	[Ra_Lifetime_smoking=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_DM=1.00]	.496	.221	.770	1.642	1.248	2.160
	[Ra_HE_DM=2.00]	.130	-.061	.321	1.139	.940	1.379
	[Ra_HE_DM=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_hp=1.00]	-.070	-.276	.136	.932	.759	1.146
	[Ra_HE_hp=2.00]	.024	-.150	.198	1.024	.861	1.218
	[Ra_HE_hp=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_HE_obe=1.00]	.175	.016	.334	1.191	1.016	1.397
	[Ra_HE_obe=2.00]	-.096	-.417	.225	.909	.659	1.253
	[Ra_HE_obe=3.00]	.000 ^a	.	.	1.000	.	.
	[Ra_DI2_it=1.00]	-.071	-.335	.194	.932	.715	1.214
	[Ra_DI2_it=2.00]	.000 ^a	.	.	1.000	.	.
	Vit B3 quartile=Q1 / Q4	.325	.096	.554	1.384	1.100	1.741
	Vit B3 quartile=Q2 / Q4	.147	-.052	.346	1.158	.949	1.413
	Vit B3 quartile=Q3 / Q4	.166	-.010	.342	1.181	.990	1.408
	Vit B3 quartile=Q4	.000 ^a	.	.	1.000	.	.
	age	.065	.059	.072	1.067	1.060	1.075

Appendix 2. Strengthening the Reporting of Observational studies (STROBE) in Epidemiology guideline

STROBE Statement—Check list of items that should be included in reports of *cross-sectional studies*

Item	No	Recommendation	Response
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Yes. In abstract
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	Yes. In abstract
Introduction			
Background/ rationale	2	Explain the scientific background and rationale for the investigation being reported	Yes. In intro
Objectives	3	State specific objectives, including any pre-specified hypotheses	Yes. In intro
Methods			
Study design	4	Present key elements of study design early in the paper	Yes. In methods
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Yes. In methods
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	Yes. In methods
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Yes. In methods
Data sources/ measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Yes. In methods

Study size	10	Explain how the study size was arrived at	Yes, In methods
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Yes. In methods
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	Yes. In methods
		(b) Describe any methods used to examine subgroups and interactions	Yes. Stratified analyses
		(c) Explain how missing data were addressed	Yes, In methods
		(d) If applicable, describe analytical methods taking account of sampling strategy	Complex sample analysis
		(e) Describe any sensitivity analyses	Yes. Vitamin B in quartile and EAR
Results			
Participants	13	(a) Report numbers of individuals at each stage of study—e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Yes. In methods,
		(b) Give reasons for non-participation at each stage	Yes. In methods,
		(c) Consider use of a flow diagram	Yes. Fig 1
Descriptive data	14	(a) Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders	Yes. In results
		(b) Indicate number of participants with missing data for each variable of interest	Yes, In methods

		confounder-adjusted estimates and their precision (e.g. 95% confidence interval). Make clear which confounders were adjusted for and why they were included	In Results
		(b) Report category boundaries when continuous variables were categorized	Yes. In methods,
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	yes, In discussion
Other analyses	17	Report other analyses done—(e.g.) analyses of subgroups and interactions, and sensitivity analyses	Yes, sensitivity and stratified analysis
Discussion			
Key results	18	Summarise key results with reference to study objectives	Yes. In discussion
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	yes, In discussion
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Yes. In discussion
Generalisability	21	Discuss the generalisability (external validity) of the study results	Yes. In discussion
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Yes.