Original Article

Factors Associated with Temporomandibular Disorders in Thai Adults

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Background: Although temporomandibular disorders (TMD) problem among Thai adults is increasing, research studies regarding TMD in Thailand are still scarce.

Objective: The aims of this study were to evaluate prevalence of as well as factors associated with TMD in Thai adults.

Materials and Methods: The survey was conducted on 1,874 Thai adults (656 males and 1,218 females), aged 20 to 93 years, residing in several provinces of central and northeastern Thailand, using both the questionnaire and the oral health examination. Data were analyzed using descriptive, bivariate statistics and multivariable logistic regression to adjust for confounding variables.

Results: The results showed that 20.5% of the participants had TMD. Findings from the multivariable logistic regression model revealed that TMD was inversely associated with body mass index and diabetes, with the adjusted odds ratios (aOR) (95% CI) being 0.949 (0.919 to 0.981) and 0.674 (0.478 to 0.952), respectively. Shallow periodontal pocket and having social security welfare were directly related to TMD with the aOR (95% CI) being 1.353 (1.044 to 1.754) and 4.198 (2.859 to 6.166). The effect of an interaction between age and heart disease towards TMD was significant (aOR (95% CI) being 0.921 (0.869 to 0.976)) It was shown that having heart disease did increase the magnitude of association at all levels of age. Age and gender were important in modelling the association of TMD. Therefore they were retained in the model although they were not significant.

Conclusion: The prevalence of TMD in these Thai adults is substantial. The findings that several risk indicators are associated with TMD suggest the need for various actions to effectively approach this problem. The implications of this research may be of use not only acting as a baseline for future study but also for prevention and planning to reduce TMD problem among adults in Thailand.

Keywords: TMD, Factors, Adults, Thailand

J Med Assoc Thai 2020;103(Suppl.1): 24-31
Website: http://www.jmatonline.com

Temporomandibular disorders or TMD is defined as a set of clinical conditions characterized by pain and dysfunction of the masticatory muscles, temporomandibular joint (TMJ), and associated hard and soft tissues. Common symptoms include pain, limitation in jaw function, and clicking jaw sounds[1]. Prior epidemiologic studies found prevalence or incidence of TMD ranged from 1.6[2], 7%[3,4], 10.1%[5], 11.75%[6], 33.3%[7], 34.9%[8], 39.2%[9], 46.1%[10], 49.9%[11], 58.9%[12], 61%[13], 61.4%[14] to 63%[15]. Regarding determinants of TMD, a recent systematic review confirmed that gender and age were associated with TMD and TMD was more prevalent among females[9,16-18]. In addition, several factors were found associated with TMD including education, marital status and health status[19], gender, health status, health behaviors and environment[4], headache, migraine, rheumatoid, gastrointestinal disorders and stress[20], pneumonia, asthma, headache and joint pain[21], allergy, migraine, arthritis, thyroiditis, abnormal hearing and stress[6]. In addition, a significant adjusted association of body mass index and TMD was reported in a large and representative Korean study[1] while another study did not find such an association when confounding factors were controlled for in the final model[22]. To date, research regarding TMD in Thailand is still scarce although TMD is found more common among Thai adults. Therefore the aim of the present study was set to examine the association between temporomandibular disorders and several factors in Thai adults.

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Materials and Methods

Sample

The samples in this cross-sectional analytic study comprised a total of 1,874 Thai adult volunteers, aged 20 to 93 years, residing in several provinces of central and northeastern Thailand during the years 2009 to 2012. Every participant received both oral examination and interview. Data analysis was performed using descriptive, univariate and multivariable logistic regression to adjust for confounding variables. The study protocol was approved by the Human

How to cite this article: Siritapetawee M, Chatrchaiwiwatana S. Factors Associated with Temporomandibular Disorders in Thai Adults. J Med Assoc Thai 2020;103(Suppl.1): 24-31.

Research Ethics Committee of Khon Kaen University, Thailand (HE612300).

Interview

The subjects received an interview on baseline characteristics including gender (male vs. female), age (year), marital status (single/married/divorced/widowed), weight (kilogram), height (meter), waist circumference (inch), body mass index (kg/m^2), income (Thai baht: THB), income category (0 to 3,000 vs. 3,001 to 90,000 THB), year of education (0 year or no education/6 years/9 years/12 years/14 years/16 years or more), occupation (no job/self-employed/government employee/merchant or private business/agriculture/housekeeper/others), having systemic diseases (yes vs. no), diabetes mellitus (yes vs. no), asthma (yes vs. no), hypertension (yes vs. no), heart disease (yes vs. no), medical welfare or medical right (self-paid/gold patent or 30-baht health-care scheme/social security scheme/government enterprise officer/company welfare/health insurance), tooth brushing (yes vs. no), visiting dentist during the previous year (yes vs. no) and type of dental treatment received during the previous year (dental checkup/scaling/extraction/restoration/root canal treatment/prosthesis treatment).

Oral examination

The oral examination was conducted by calibrated dentists. A mouth mirror, an explorer as well as WHO periodontal probe were used to assess the oral health conditions. The signs and symptoms of TMD, periodontal conditions, debris deposition as well as dental caries status and treatment need were evaluated based on WHO criteria[23]. TMD was considered to be existed if the participants had at least one of the following signs: clicking of one or both temporomandibular joints (TMJ), tenderness (on palpation) of the anterior temporalis and/or masseter muscles on one or both sides, or reduced jaw mobility (opening <30 mm) once or more per week. Periodontal conditions were examined using the Community Periodontal Index (CPI). While the dental caries status and treatment need were determined using the Decayed, Missing and Filled Teeth (DMFT) index.

Data quality control

To gain good validity in collecting the data, the dentists who conducted the examination had been trained and practiced until he or she was able to use the oral health indices correctly. Reliability of the oral examination within-examiner and between-examiners were ensured by having acceptable kappa or ICC values (depending on the indices used) for repeatability of the oral examination greater than 0.80. Moreover, to ensure consistency in conducting the oral examinations in the field, repeated measurements in 10% of the samples were done and the reliability throughout the whole examination were greater than 0.80. The research staff who conducted the interview also had been well-trained to do their job. To reduce errors in the process of data entry, double data entry was done independently by two well-trained research teams.

Data analysis

The data were analyzed using SPSS for Windows version 16.0 (Chicago, SPSS Inc.)**.** Results were obtained by means of descriptive, bivariate and multivariable logistic regression. Descriptive statistics using mean, standard deviation and percentage were employed. To assess the preliminary association between TMD (defined as having at least 1 symptom of TMD) and each potential predictor, not yet adjusting for confounding factors, a crude odds ratio resulting from univariate logistic regression was obtained. Then a final multivariable logistic regression model was constructed to define a set of variables associated with TMD, adjusting for confounding factors. The adjusted odds ratio (aOR) along with its 95% confidence interval (95% CI) for each variable was reported. Each aOR (95% CI) was considered statistically significant when the 95% CI did not include 1 and had a *p*-value less than 0.05.

Results

A total of 1,874 Thai adults residing in several provinces of central and northeastern Thailand participated in the study. Findings in Table 1 show that of all the 1,874 volunteers, 656 (35%) were males and 1,218 (65%) were females. Their ages ranged from 20 to 93 years, with the mean age 48.33 and SD 15.56 years. Most people stayed married (81%), had 6 years of education (58.2%) and worked in agricultural areas (37.3%) for a living. Their monthly income ranged between 0 to 90,000 Thai baht (THB) and 64.1% earned more than 3,001 THB a month. Regarding their underlying diseases, diabetes was reported in about 40% of the participants while heart disease was found 4.6%. Most people (63.8%) did not visit dentist during the previous year. The main reason for visiting dentist was for dental extraction (22.7%). Among the choices of medical welfare, more than a half of people had gold patent or 30-baht health-care scheme (55.5%) while around 26.2% used social security scheme.

Regarding oral health conditions, at least one sign or symptom of TMD was found in 20.5% of people. Most people (72.7%) lost at least one tooth and most teeth missing were due to dental caries (49.8%). Periodontitis defined as having shallow or deep periodontal pocket was found in about 54.6% of people whereby shallow periodontal pocket was the majority (51.2%).

Results from the bivariate analyses in Table 2 show that several factors were primarily and inversely associated with TMD including age, gender, BMI, diabetes, hypertension, visiting dentist, medical welfare (self-payment, gold patent or 30-baht health-care scheme, government enterprise officer), denture wearing, missing teeth, shallow periodontal pocket, moderate and severe debris deposit. While factors associated directly with TMD were education, occupation, income, asthma, dental scaling, dental restoration, medical welfare (social security scheme, health insurance), filled teeth, gingival bleeding and mild debris deposit.

Table 3 shows findings from the final multivariable logistic regression model having TMD as an outcome. TMD

Table 1. Characteristics of the study participants (n = 1,874)

Variable	Number (%)
Age (mean, SD, range in year)	48.33, 15.56, 20 to 93
Gender	
Male	656 (35%)
Female	1,218 (65%)
Marital status	
Married	1,137 (81%)
Separated	135 (9.6%)
Single	104 (7.4%)
Divorced	28 (2.0%)
Body Mass Index: BMI (mean, SD, range in kg/m^2)	24.19, 4.29, 9 to 58
Education year	
0 year (no education)	104 (5.6%)
6 years	1,089 (58.2%)
9 years	135 (7.2%)
12 years	293 (15.7%)
14 years	130 (6.9%)
16 years or more	104 (5.6%)
Others	17 (0.9%)
Occupation	
Agriculture	699 (37.3%)
Industrial employee	457 (24.4%)
No job, job with no payment	323 (17.3%)
Self-employed	183 (9.8%)
Merchant, private business	111 (5.9%)
Government employee	25 (1.3%)
Others	74 (4.0%)
Monthly income (mean, SD, range in Thai Baht: THB)	6,658, 6,689, 0 to 90,000
Income category (THB)	
0 to 3,000 THB	463 (35.9%)
3,001 to 90,000 THB	827 (64.1%)
Systemic disease	
Yes	679 (36.3%)
No	1,192 (63.7%)
Diabetes	
Yes	749 (40.0%)
No	1,122 (60.0%)
Hypertension	
Yes	497 (26.7%)
No	1,367 (73.3%)
Heart disease	
Yes	85 (4.6%)
No	1,780 (95.4%)
Asthma	
Yes	70 (3.8%)
No	1,795 (96.2%)
Visiting dentist	
Yes	675 (36.2%)
No	1,191 (63.8%)
Dental checkup	
Yes	230 (14.8%)
No	1,320 (85.2%)
Dental scaling	
Yes	221 (14.3%)
No	1,328 (85.7%)
Dental extraction	
Yes	352 (22.7)
No	1,196 (77.3)
Dental restoration	
Yes	121 (7.8)
No	1,428 (92.2)
Root canal treatment	
Yes	27 (1.7)
No	1,522 (98.3)
Prosthetic treatment	
Yes	65 (4.2)
No	1,483 (95.8)
Self-payment for medical fee	
Yes	199 (10.6)
No	1,675 (89.4)
Gold patent (30 baht health-care scheme)	
Yes	1,040 (55.5)
No	834 (44.5)
Government enterprise officer	
Yes	83 (4.4)
No	1,791 (95.6)
Social security scheme	
Yes	491 (26.2)
No	1,383 (73.8)
Company welfare	
Yes	154 (8.2)
No	1,720 (91.8)
Health insurance	
Yes	92 (4.9)
No	1,782 (95.1)
Denture wearing	
Yes	279 (15.0)
No	1,584 (85.0)
Temporomandibular disorders	
Yes	380 (20.5)
No	1,478 (79.5)
Tooth loss	
Yes	1,362 (72.7)
No	512 (27.3)
Tooth loss due to dental caries	
Yes	933 (49.8)
No	941 (50.2)
Tooth loss due to periodontal diseases	
Yes	538 (28.7)
No	1,336 (71.3)
Periodontitis	
Yes	1,024 (54.6)
No	850 (45.4)
Shallow periodontal pocket	
Yes	960 (51.2)
No	914 (48.8)
Deep periodontal pocket	
Yes	343 (18.3)

was associated with lower BMI, with the aOR (95% CI) being 0.949 (0.919 to 0.981). While lower prevalence of diabetes was associated with TMD, with the aOR (95% CI) being 0.674 (0.478 to 0.952). The odds of getting TMD was

Table 1. Cont.

Variable	Number (%)
Teeth decayed (mean, SD, range in teeth number)	2.53, 2.88, 0 to 24
Teeth missing due to caries (mean, SD, range)	3.45, 6.45, 0 to 32
Teeth missing due to periodontitis (mean, SD, range)	2.72, 6.77, 0 to 32
Teeth filled (mean, SD, range)	0.71, 1.89, 0 to 16
Gingival bleeding (mean, SD, range in sextant)	0.55, 1.19, 0 to 6
Calculus (mean, SD, range in sextant)	0.12, 0.47, 0 to 6
Calculus with bleeding (mean, SD, range in sextant)	2.61, 1.92, 0 to 6
Shallow periodontal pocket (mean, SD, range in sextant)	1.12, 1.41, 0 to 6
Deep periodontal pocket (mean, SD, range in sextant)	0.30, 0.75, 0 to 6
Mild debris deposit (mean, SD, range in sextant)	2.18, 1.69, 0 to 6
Moderate debris deposit (mean, SD, range in sextant)	1.50, 1.45, 0 to 6
Severe debris deposit (mean, SD, range in sextant)	0.81, 1.38. 0 to 6

1.353 (95% CI: 1.044, 1.754) times higher among people having shallow periodontal pocket. Likewise, the odds of getting TMD was 4.198 (95% CI: 2.859, 6.166) times higher among people having social security welfare. Calculations of the relative odds ratio concerning the interaction effect between age and heart disease towards TMD are shown in Table 4. Based on the estimation, having heart disease did modify the association between age and TMD at all levels of age. In particular, at the level mean-standard deviation of age, the relative odds ratio was lowest (1.000) in the group of people without heart disease while it was highest (223.632) in the group of people having heart disease.

Discussion

The proportion of TMD in this study is 20.5%, which is higher compared to previous research[2-6] but the percentage was lower than those reported in some research[7-15]. Different populations and diagnosed criteria may also be responsible for the discrepancy in prevalence of TMD found in any research studies. For example, high percentages of TMD were found among dental students[12,24].

Factors associated with TMD in our study include body mass index (BMI), diabetes, heart disease, periodontal pocket, social security welfare and the interaction between age and heart disease. Age and gender were two important variables in predicting TMD. Therefore they were retained in the multivariable logistic regression model although they were not statistically significant in the present study.

The finding that lower BMI was associated with TMD after adjusting for several confounding factors in this study supports the findings of prior research[1,22,25]. Rhim et al analyzed the large and representative data taken from the Korea National Health and Nutrition Examination Survey (KNHANES) and found that TMD was inversely related to BMI after adjusting for age, tobacco smoking, alcohol use, exercise, and mental stress[1]. Likewise, a recent study in China[25] reported that overweight and obesity were associated with chronic migraine and patients having chronic migraine are more likely to have a higher body mass index. A study conducted by Jordani et al[22] reported a preliminary association between obesity and TMD but such an association disappeared when gender, migraine, non-specific somatic symptoms and OSAS were adjusted for in the analysis. Likewise, Wright et al[26] reported that TMD was associated with overweight in a twin study but the association was no longer significant after adjusting for age, gender, and depression.

There are many possible explanations for the association between decreased BMI and TMD. Several studies have reported that types of food affect the prevalence or severity of TMD[27-32]. Obese subjects often show abnormal eating behaviors such as avoiding hard food[27], high intake of soft fatty food[28,29], and chewing less[28]. Dietary intake of hard food is inversely related to increasing waist circumference[30]. A higher intake of fiber was seen in healthy adults more than in TMD patients[31]. Mean weight loss was greater in a low-fat and high-fiber diet group[32]. Moreover, decreased bite force may have some connections to lower BMI in TMD patients based on previous reports that bite force in people having TMD problem is significantly lower compared to normal people[33-35]. In addition, TMD patients had difficulty eating hard foods such as meat and apples due to pain[36].

A number of previous studies[2,4,8,9,16-18,20,21] reported significant associations between gender or age with TMD. In the present study, both gender and age had highly significant associations with TMD only in the bivariate analysis, with the crude odds ratio (95% CI) being 0.570 (0.453 to 0.717) and 0.963 (0.955 to 0.971) for gender and age respectively. However, those significant associations of gender or age with TMD disappeared after adjusting for various variables in the multivariable logistic regression model.

The findings that social characteristics such as marital status, education or occupation were associated with TMD in prior studies[19,37] were challenged in this study. In our study, occupation, education and income were significantly related to TMD only in the bivariate analysis. The only social variable associated directly with TMD in the multivariable logistic regression model is social security scheme. It is highly possible that having social security welfare is a proxy variable for several social characteristics based on the analysis that this variable demonstrated highly associations with occupation, education and income in this study (Chi-squared p-value <0.001, data not tabulated).

The significant association between oral health condition such as having periodontal pocket and TMD has never been evaluated before. List et al conducted a study in a small group of 21 boys and 42 girls, aged 12 to 18 years and

Table 2. Crude odds ratio and 95% CI of variables associated with TMD in univariate logistic regression (n = 1,874)

Variable	Crude Odds Ratio (95% CI)	*p*-value
Age (year)	0.963 (0.955 to 0.971)	<0.001
Gender (male vs. female)	0.570 (0.453 to 0.717)	<0.001
Marital status	1.486 (0.956 to 2.311)	0.078
Body mass index: BMI (kg/m^2)	0.904 (0.877 to 0.932)	<0.001
Education	1.422 (1.321 to 1.531)	<0.001
Occupation	1.267 (1.200 to 1.338)	<0.001
Income (Thai baht)	1.000 (1.000 to 1.000)	<0.001
Income category (0 to 3,000 vs. 3,001 to 90,000 THB)	2.351 (1.745 to 3.168)	<0.001
Systemic disease (yes vs. no)	0.803 (0.632 to 1.021)	0.074
Diabetes (yes vs. no)	0.352 (0.271 to 0.459)	<0.001
Hypertension (yes vs. no)	0.571 (0.430 to 0.757)	<0.001
Heart disease (yes vs. no)	0.869 (0.491 to 1.539)	0.630
Asthma (yes vs. no)	2.252 (1.362 to 3.723)	0.002
Visiting dentist (yes vs. no)	0.755 (0.593 to 0.963)	0.024
Dental checkup (yes vs. no)	1.170 (0.806 to 1.698)	0.410
Scaling (yes vs. no)	1.465 (1.021 to 2.101)	0.038
Dental extraction (yes vs. no)	1.180 (0.858 to 1.623)	0.309
Dental restoration (yes vs. no)	2.210 (1.442 to 3.387)	<0.001
Root canal treatment (yes vs. no)	0.979 (0.334 to 2.867)	0.969
Prosthetic treatment (yes vs. no)	1.366 (0.732 to 2.549)	0.328
Self-payment for medical fee (yes vs. no)	0.515 (0.331 to 0.802)	0.003
Gold patent (30-baht health-care scheme) (yes vs. no)	0.352 (0.278 to 0.445)	<0.001
Government enterprise officer (yes vs. no)	0.481 (0.238 to 0.971)	0.041
Social security scheme (yes vs. no)	4.831 (3.802 to 6.138)	<0.001
Health insurance (yes vs. no)	3.226 (2.101 to 4.954)	<0.001
Wearing denture (yes vs. no)	0.456 (0.308 to 0.676)	<0.001
Teeth decayed	1.025 (0.987 to 1.065)	0.199
Teeth missing due to caries	0.966 (0.946 to 0.987)	0.002
Teeth missing due to periodontitis	0.978 (0.960 to 0.998)	0.027
Teeth filled	1.116 (1.060 to 1.175)	<0.001
Gingival bleeding (sextant)	1.315 (1.212 to 1.427)	<0.001
Calculus (sextant)	0.788 (0.590 to 1.052)	0.106
Calculus with bleeding (sextant)	1.049 (0.989 to 1.112)	0.110
Shallow periodontal pocket (sextant)	0.906 (0.833 to 0.987)	0.023
Deep periodontal pocket (sextant)	1.019 (0.879 to 1.181)	0.802
Mild debris deposit (sextant)	1.169 (1.094 to 1.249)	<0.001
Moderate debris deposit (sextant)	0.904 (0.834 to 0.981)	0.015
Severe debris deposit (sextant)	0.810 (0.733 to 0.895)	<0.001

Table 3. Multivariable logistic regression model of the variables associated with TMD (n = 1,874)*

Variable	Adjusted Odds Ratio (95% CI)	*p*-value
Body mass index: BMI (kg/m^2)	0.949 (0.919 to 0.981)	0.002
Diabetes (yes vs. no)	0.674 (0.478 to 0.952)	0.025
Shallow periodontal pocket (yes vs. no)	1.353 (1.044 to 1.754)	0.022
Social security scheme (yes vs. no)	4.198 (2.859 to 6.166)	<0.001
Heart disease (yes vs. no)	223.74 (8.13 to 6157.0)	0.001
Heart disease by age	0.921 (0.869 to 0.976)	0.005
Age (year)	1.003 (0.991 to 1.016)	0.592
Gender (male vs. female)	0.920 (0.710 to 1.192)	0.529

* Nagelkerke R Square = 15.9%; model significance at $p<0.001$

evaluated dental occlusion including overjet, overbite, open bite, deep bite and cross bite in relation to TMD. They concluded that emotional problem and psychosocial factors are more important than dental occlusion regarding the

Table 4. Relative odds ratio calculating from the interaction between heart disease and age in the multivariable logistic regression model predicting TMD (n=1,874)

Variable	Relative Odds Ratio	
	No heart disease	Heart disease
At mean + standard deviation of age	1.003	206.438
At mean of age	1.156	4.681
At mean - standard deviation of age	1.000	223.632

etiology of TMD[38]. Previous research evidence reported that having periodontal pocket or periodontitis can lead to tooth loss as an ultimate result[39,40] and having periodontal pocket and tooth loss in this study were closely related (data not tabulated). This finding tends to support the result of a prior research conducted by Casanova-Rosado et al that there existed a significant association between tooth loss and TMD[10].

The finding that lower prevalence of diabetes was found more among people having TMD problem is in agreement with a prior study[1]. In addition, past studies also reported connections of TMD with health problems such as headache, migraine, rheumatoid, gastrointestinal disorders and stress[20], pneumonia, asthma, headache and joint pain[21], allergy, migraine, arthritis, thyroiditis, abnormal hearing and stress[6].

The effect of interaction between age and heart disease towards TMD has never been investigated. Based on the finding of the present study, having heart disease did modify the association between age and TMD and the relative odds ratios were calculated based on the method described previously[39]. It is evident that at the same level of age (mean-SD of age) the relative odds ratio was lowest (1.000) in the group of people without heart disease while it was highest (223.632) in the group of people having heart disease. Although the explanation is still unclear, the findings value further investigation.

The main strengths of the present study lie in the fact that it is the very first to assess the association between TMD and various factors simultaneously using a large dataset. Thus several confounding factors including age, gender, education level, occupation, marital status, income, medical rights or medical welfare (gold patent or 30-Baht health-care scheme, social security scheme, company welfare, health insurance, government enterprise officer, self-payment), BMI, oral health behaviors (tooth brushing, visiting dentist, receiving dental care, etc.) and oral health status including dental caries (decayed teeth, missing teeth, filled teeth), periodontal conditions (gingival bleeding, calculus, calculus with bleeding, shallow and deep periodontal pocket) and debris deposit were evaluated simultaneously with TMD. In addition, examination of TMD was conducted by calibrated dentists, with acceptable reliability (kappa or ICC >0.80). However, the present study also holds its limitations due to its cross-sectional design whereby a random time period is assessed rendering it difficult to infer causality and only allowing study of associations. Furthermore, since the adjusted or unadjusted associations between TMD and psychologic stress and anxiety were reported in many studies[6,10,12,14,20,41-44], future research should include stress and anxiety in the model predicting TMD.

Despite the limitation, the authors hope that the findings may be useful as a reference for further investigations. Future epidemiological studies among Thai people may evaluate other factors reported to have an association with TMD such as stress or anxiety. Prospective clinical or laboratory studies should be conducted further to determine mechanisms underlying the relationship between TMD and health or oral health conditions.

Conclusion

Prevalence of TMD among Thai adults in the present study is substantial. Even after adjusting for age and gender, TMD is significantly associated with decreased BMI, low prevalence of diabetes, having social security welfare, periodontitis (having shallow periodontal pocket) and the interaction between age and having heart disease. Evaluation of the effects of interaction between age and having heart disease shows that having heart disease increases TMD at every level of age.

What is already known on this topic?

TMD has been reported to have crude or adjusted associations with several variables including age, gender, education, occupation, marital status, health behaviors, environment and health conditions such as headache, migraine, rheumatoid, gastrointestinal disorders, stress, pneumonia, asthma, allergy, arthritis, thyroiditis, abnormal hearing. The majority of the research evidence came from outside Thailand.

What this study adds?

Oral health status (periodontitis) and health conditions such as diabetes and heart disease have significantly adjusted associations with TMD. In addition, evaluation of a significant effect of the interaction between age and heart disease reveals that having a health condition like heart disease is able to increase severity of TMD among the group of people with the lowest risk to the highest risk. Based on the fact that the present study was conducted in a very large group of Thai adults, the findings are substantial and far

beyond chance. The associations of TMD with oral health and health conditions thus value further investigation not only for Thai people but also for people of other nations as well.

Acknowledgements

The authors appreciate the research funding from the Neuroscience Research and Development Group, Khon Kaen University, Khon Kaen, Thailand.

Potential conflicts of interest

The authors declare no conflicts of intetest.

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ปัจจัยที่สัมพันธ์กับความผิดปกติของขมับ-ขากรรไกรในคนไทยวัยผู้ใหญ่

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ภูมิหลัง: การศึกษาเกี่ยวกับความผิดปกติของขมับ-ขากรรไกรในคนไทยยังมีไม่มาก แม้ว่าปัญหาความผิดปกติของขมับ-ขากรรไกรในคนไทยจะพบได้มากขึ้น

วัตถุประสงค์: เพื่อศึกษาความชุกและปัจจัยบ่งชี้ความเสี่ยงที่สัมพันธ์กับการเกิดความผิดปกติของขมับ-ขากรรไกรในคนไทยวัยผู้ใหญ่

วัสดุและวิธีการ: ทำการศึกษาในคนไทย จำนวนทั้งสิ้น 1,874 คน เป็นผู้ชาย 656 คน และผู้หญิง 1,218 คน มีอายุระหว่าง 20 ถึง 93 ปี อาศัยอยู่ในพื้นที่หลายจังหวัดของภาคกลางและภาคตะวันออกเฉียงเหนือของประเทศไทย โดยใช้แบบสอบถามร่วมกับการตรวจสุขภาพช่องปาก วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา สถิติวิเคราะห์ความสัมพันธ์ระดับสองตัวแปร และสมการถดถอยพหุคูณลอจิสติกเพื่อควบคุมตัวแปรรบกวน

ผลการศึกษา: พบว่าความชุกของการเกิดความผิดปกติของขมับ-ขากรรไกรมีค่าเท่ากับร้อยละ 20.5 และปัจจัยบ่งชี้ความเสี่ยงของการเกิดความผิดปกติของขมับ-ขากรรไกรในแบบจำลอง สมการถดถอยพหุคูณลอจิสติก พบว่าความผิดปกติของขมับ-ขากรรไกรมีความสัมพันธ์เชิงผกผันกับดัชนีมวลกายและโรคเบาหวาน โดยมีอัตราส่วนความเสี่ยงที่ปรับแล้ว (ช่วงเชื่อมั่น 95%) เท่ากับ 0.949 (0.919 ถึง 0.981) และ 0.674 (0.478 ถึง 0.952) ตามลำดับ การมีร่องลึกปริทันต์ระดับตื้นและการใช้สวัสดิการประกันสังคม มีความสัมพันธ์ไปในทิศทางเดียวกับความผิดปกติของขมับ-ขากรรไกร โดยมีอัตราส่วนความเสี่ยงที่ปรับแล้ว (ช่วงเชื่อมั่น 95%) เท่ากับ 1.353 (1.044 ถึง 1.754) และ 4.198 (2.859 ถึง 6.166) ปฏิสัมพันธ์ระหว่างโรคหัวใจกับอายุสัมพันธ์กับความผิดปกติของขมับ-ขากรรไกรอย่างมีนัยสำคัญทางสถิติ (อัตราส่วนความเสี่ยงที่ปรับแล้ว (ช่วงเชื่อมั่น 95%) เท่ากับ 0.921 (0.869 ถึง 0.976)) การมีโรคหัวใจทำให้ขนาดของความสัมพันธ์เพิ่มขึ้นทุกระดับของอายุ ตัวแปรอายุและเพศมีความสำคัญในการสร้างแบบจำลองความสัมพันธ์กับความผิดปกติของขมับ-ขากรรไกร ดังนั้นอายุและเพศจึงได้รับการคงไว้ในแบบจำลองทั้งที่ไม่ได้มีนัยสำคัญทางสถิติ

สรุป: การเกิดความผิดปกติขมับ-ขากรรไกรในคนไทยวัยผู้ใหญ่มีความสัมพันธ์กับปัจจัยต่าง ๆ หลายด้าน ซึ่งข้อมูลที่ได้จากการศึกษานี้สามารถนำไปใช้เป็นข้อมูลพื้นฐานสำหรับการศึกษาวิจัยในอนาคตและยังประโยชน์ในการวางแผนการลดการเกิดความผิดปกติของขมับ-ขากรรไกรในคนไทยได้ต่อไป