

Impact of malocclusion and common oral diseases on oral health–related quality of life in young adults

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Introduction: The aim of this study was to assess the association between malocclusion and oral health–related quality of life in young adults without orthodontic treatment, controlling for sociodemographic factors and common oral diseases. **Methods:** The sample consisted of 429 Korean patients (328 men, 101 women) 18 to 32 years of age. They completed the Korean version of the oral health impact profile-14 questionnaire and had a clinical examination, including an assessment with the index of orthodontic treatment need–dental health component. We collected sociodemographic information (age, sex, and education level) and evaluated other common oral diseases (decayed, missing, and filled teeth; periodontal health status; temporomandibular disorder; and oral soft tissue diseases). **Results:** Multiple logistic regression analysis showed that patients requiring extensive orthodontic treatment were more than 2.7 times as likely to have poor oral health–related quality of life as the corresponding “no treatment needed” reference group (odds ratio, 2.74; 95% confidence interval, 1.60-4.59; $P < 0.001$). Severe malocclusion is significantly associated with functional limitations, physical pain, and social disability in young adults. **Conclusions:** Malocclusion is a key factor associated with poor quality of life caused by limited oral function, pain, and social disability in young adults. (Am J Orthod Dentofacial Orthop 2015;147:587-95)

Traditionally, oral health epidemiology studies have predominantly measured clinical oral conditions, such as dental caries and periodontal disease, to determine a patient’s decayed, missing, and filled teeth (DMFT) index and community periodontal index (CPI).¹ However, there is a growing consensus that conventional clinical-epidemiologic measurements by professionals differ from the self-assessment of oral health by individuals.² Thus, the concept of oral health–related quality of life (OHRQOL), as typically applied in health outcomes research, has been developed to quantify the extent to which oral health problems interfere in a

patient’s daily life and well-being. OHRQOL is a multidimensional concept that includes socioeconomic status, physical oral health status, and self-perceived oral health–related psychological factors.³⁻⁶

Patients with severe malocclusion may report various oral health impacts of the malocclusion that can affect their quality of life in many ways. Orthodontic treatment or orthognathic surgery not only improves oral function and facial esthetics, but also reduces emotional suffering, enhancing the patient’s self-esteem, socialization, and quality of life.⁷ However, the impact of malocclusion on a patient’s quality of life has received much less attention than the impact of other common oral diseases because malocclusion is considered to be “a set of dental deviations” rather than a disease and because orthodontic treatment does not cure a condition but, rather, corrects variations from a somewhat arbitrary norm.⁸ A better understanding of the effects of malocclusion from a patient’s point of view is needed in the planning and evaluation of public health interventions and for appropriate allocation of resources.⁹ Data currently available on the impact of malocclusion on quality of life are mostly derived from a few clinical studies in which a limited number of covariates were controlled for; this restricts the ability to generalize these findings to wider populations.^{7,10-14} Most previous

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studies used the generic oral health impact profile-14 scale (OHIP-14). It captures not only the impacts caused by malocclusion, but also those related to other oral diseases, and it does not distinguish the specific causes of the impacts that are recorded.¹⁵⁻¹⁸ Since many young people with a malocclusion also have dental caries, missing teeth, periodontitis, temporomandibular disorder (TMD), or stomatitis, neglecting to consider or separate the impact of these disease conditions can seriously affect the assessment of the association between malocclusion and the patient's quality of life. Therefore, problems arise in the data analyses of these types of studies not because of the use of a generic OHIP-14 measure per se, but because of the failure to recognize and control for other conditions that are occurring simultaneously in the mouth that also impact the OHRQOL measurement.

Using data from Korean young adults who had not received orthodontic treatment, in this study we aimed to assess the association between malocclusion and OHRQOL. Patients were assessed with the OHIP-14, and the effects of malocclusion were evaluated independently from the impacts attributable to sociodemographic factors and to common oral diseases also present in these patients. In this study, 2 null hypotheses were tested. The first null hypothesis was that malocclusion is not associated with OHRQOL in patients without orthodontic treatment. The second null hypothesis was that malocclusion is not associated with OHRQOL when controlling for other oral diseases and sociodemographics.

MATERIAL AND METHODS

This study was a cross-sectional evaluation of 440 young adults who arrived at the dental department of the Health Services of the Capital Defense Command, Seoul, Republic of Korea, seeking oral health screening and education between December 2013 and August 2014. The center is funded by the Republic of Korea Army to provide primary medical care to soldiers and local residents. Patients were considered as candidates for the study if they met the following criteria: (1) over 18 years old, (2) no current or past history of orthodontic treatment or orthognathic surgery, and (3) no severe dentofacial anomalies, such as a cleft lip or palate. Patients with serious medical conditions for which they had been hospitalized in the past 3 months or patients taking medications were excluded to prevent any possible confounding effects of these conditions or medications on the patient's quality of life. Eleven patients refused to complete the questionnaire and were consequently excluded from the study. Thus, in total, 429 male and female patients, 18 to 32 years of age,

were eligible for the study. This study was performed with the understanding of each participant, and written informed consent was obtained from each participant. This study followed the guidelines of the Declaration of Helsinki and was approved by the ethics committee of the Republic of Korea Army Headquarters.

Data were collected through both face-to-face interviews and clinical examinations. During the interviews, the patients provided information on their sociodemographics, including age, sex, and educational level. OHRQOL was assessed using the Korean version of the OHIP-14 questionnaire,¹⁹ which was previously translated and validated.²⁰ All 14 OHIP questions ask how frequently the patient has experienced an adverse impact from oral conditions during the preceding 3 months. For example, 1 item asks "how often during the past 3 months have you had painful aching in your mouth because of problems with your teeth, mouth, or dentures?" The 14 questions cover the following 7 domains of oral health impact: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The responses followed a Likert-type scale coded as follows: 0, never; 1, hardly ever; 2, occasionally; 3, fairly often; and 4, very often. The OHIP-14 total score is calculated as the sum of the 14 scores, generating scores from 0 to 56, with a higher score indicating more negative impacts and a lower OHRQOL.

In the clinical assessments, dentition status was evaluated using the World Health Organization criteria for DMFT; the sum of the numbers of decayed teeth (DT), missing teeth (MT), or filled teeth (FT) was recorded. The teeth not counted included congenitally missing teeth, supernumerary teeth, unerupted teeth, teeth removed for reasons other than dental caries, and deciduous teeth retained in the permanent dentition. When a carious lesion or both a carious lesion and a restoration were present, the tooth was listed as a DT. When a tooth had been extracted because of caries (verified by interview), it was listed as a MT. When a permanent restoration was present and when a restoration was defective but not decayed, it was listed as a FT.²¹

Periodontal health status was evaluated using the CPI. The teeth selected for evaluation included 8 first and second molars, the maxillary right central incisors, and the mandibular left central incisors. Clinical conditions were rated with the CPI as follows: 0, no sign of disease; 1, gingival bleeding after gentle probing; 2, supragingival and subgingival calculus; 3, pathological pocket of 4 to 5 mm in depth; and 4, pathological pocket of 6 mm or more in depth.²²

The presence and severity of signs and symptoms of TMD were detected using a questionnaire composed of

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