

Treatment satisfaction and its influencing factors among adult orthodontic patients

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Introduction: The aim of this study was to investigate the level of satisfaction for orthodontic treatment among adult patients. In addition, the influencing host factors were monitored for their associations with satisfaction.

Methods: A questionnaire was designed to measure the level of satisfaction in 10 items; overall satisfaction, tooth alignment, facial appearance, eating and chewing, confident smile and self-image, retention state, treatment duration, treatment costs, intention to recommend, and relief of previous concerns, using a 5-point Likert scale. Total satisfaction was calculated by averaging the Likert scores from the 10 items. The survey was conducted, and the results from 298 adults were evaluated. **Results:** For the overall satisfaction item, 45.0% were very satisfied, and 39.9% were satisfied, resulting in a satisfaction ratio of 84.9%. Total satisfaction score was 3.9. The level of satisfaction for tooth alignment and confident smile and self-image were significantly higher than facial appearance and eating and chewing ($P < 0.001$). Patients aged 50 and above were more satisfied than the younger ones, and men were more satisfied than women ($P < 0.05$). **Conclusions:** Overall, adult patients were highly satisfied with orthodontic treatment. Age, sex, motivation, expected concern, and discomfort influenced the level of satisfaction. (Am J Orthod Dentofacial Orthop 2018;153:808-17)

As people continue to age, orthodontic treatment is becoming more commonly accepted by adults. In the United States, adult orthodontic patients increased from 15.4% to 23% between 1981 and 2013; accordingly, the proportion of orthodontists treating adults also increased from 51% to 98.6%.¹ A survey of the members of the American Association of Orthodontists also reported that the proportion of adult orthodontic patients (ages 18–54) increased by 14% between 2010 and 2012.² In Asian countries with aging

populations, the ratio of middle-aged orthodontic patients (age 40 and above) also doubled between 2008 and 2012.³

Adult patients often have complex treatment needs in addition to the predisposing malocclusion. Orthodontic treatment may be selected as part of interdisciplinary treatment for restoration or rehabilitation after tooth loss or periodontal breakdown, or to prevent further deterioration caused by oral diseases.⁴ Adults are more concerned about treatment and show active attitudes toward the progress and outcome of their treatment.⁵

Motivation, expectation, and subjective level of satisfaction after orthodontic treatment in adult patients can be regarded as important parameters to measure the overall outcome and significance of orthodontic treatment. However, in current clinical settings, orthodontic outcome is mainly defined through objective morphologic features by orthodontic specialists,^{6,7} whereas evaluation of the subjective outcomes is still limited, especially in adults.

Patient satisfaction is generally defined as a perceived value judgment and sustained response to service-related stimuli before, during, and after use of the service.⁸ Patient satisfaction with orthodontic treatment has been previously reported at a broad range of 34% to 95%,^{9,10} but these figures mostly represent satisfaction for tooth alignment^{11–14} or simple

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All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.

Supported by the Basic Science Research Program through the National Research Foundation of Korea funded by the Ministry of Science, Information, Communications Technology, and Future Planning (National Research Foundation 2016R1A2B4014882).

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Submitted, March 2017; revised and accepted, September 2017.

0889-5406/\$36.00

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<https://doi.org/10.1016/j.ajodo.2017.09.015>

satisfaction with treatment results^{10,15-17} in adolescent patients and their caregivers.^{10,12,13,18,19} Although reports on the level of satisfaction among adult orthodontic patients is limited, Riedmann et al²⁰ reported that 78% of adult patients were completely satisfied with their treatment outcome. However, this is not enough to represent the satisfaction of adults with orthodontic treatment. Among the alternative options of satisfied or not satisfied with the treatment outcome, 97% answered satisfied but 22% of these respondents pointed out unsatisfactory matters, so 78% of them were classified as completely satisfied.

The aim of this study was first to develop a simple questionnaire that can be applied to evaluate the subjective level of satisfaction after orthodontic treatment. Second, we conducted a large-scale prospective survey to determine the level of treatment satisfaction among adult patients and evaluated how the host factors such as age, sex, treatment motivation, concerns, and discomfort can influence the level of satisfaction.

MATERIAL AND METHODS

Before the development of the questionnaire, previous studies on satisfaction after orthodontic treatment were reviewed. These studies used different questionnaires, and there were no formal questionnaires. The overall guidelines for questionnaire development followed the guidelines of Williams.²¹

First, a focus group was constructed to develop the questionnaire. The focus group consisted of the main researcher (R.L.), 2 experienced orthodontists, (C.J.C., S.H.) and 1 biostatistics professor (H.L.). The main researcher reviewed questionnaires in the previous studies that examined satisfaction after orthodontic treatment (Supplementary Table I). A draft questionnaire was developed to assess satisfaction, motivation, concerns, and discomfort of orthodontic treatment through focus group meetings.

Individual interviews of 5 orthodontists with various level of clinical experience and 10 patients using the draft questionnaire to accept a variety of opinions were performed by the main researcher. All 10 patients had undergone orthodontic treatment. Based on the results of the interviews, the questionnaire was reconstructed.

We conducted a pilot survey of 10 patients who had undergone orthodontic treatment. We asked for comments on various questions that were difficult to understand or unclear. The 10 respondents did not spend more than 10 minutes taking the survey.

The questionnaires consisted of questions to assess psychological status such as motivation for orthodontic

treatment, expected concerns before treatment, discomfort during and after treatment, along with the level of satisfaction after orthodontic treatment (Fig 1).

The motivation, concerns, and discomfort categories included multiple-choice questions. Taking into account that there can be multiple responses, patients were asked to rank their responses. The first response was used for statistical analysis. At the end of the closed-ended multichotomous questions, an other item was included to allow unexpected responses.

Specific levels of satisfaction were further divided into 10 items in the questionnaire. Along with overall satisfaction, we asked about satisfaction for tooth alignment, facial appearance, eating and chewing, and confident smile and self-image to monitor the satisfaction levels of the treatment outcome. The level of satisfaction of the retention state,¹⁴ treatment duration,^{17,20,22} costs,¹⁸⁻²⁰ intention to recommend orthodontic treatment to others,¹⁵ and relief of previous concerns related to orthodontic treatment¹⁷ were also included, since these items reportedly influence, or are influenced by, the level of satisfaction.

The Likert scale was used for each satisfaction item from very dissatisfied (1 point) to very satisfied (5 points). The last item, relief of previous concerns, was scored inversely (Supplementary Table II). Satisfaction ratio was defined as the summated ratio of very satisfied and satisfied. An average of the 10 scores was calculated and defined as total satisfaction. The Cronbach alpha was calculated to measure the internal consistency of the 10 satisfaction items.

Methods for evaluating validity, reliability, and acceptability of newly developed questionnaires are listed in Table I.

The survey was approved by the institutional review board of Gangnam Severance Hospital, Yonsei University, in Seoul, Korea.

In the study of Riedmann et al,²⁰ the satisfaction rate of orthodontic treatment in adult patients was 78%, and the sample size was obtained using this. One sample proportion test was used with 95% confidence intervals and margin error of 5%. The estimated sample size was 264 subjects. The proportion of patients aged 19 years or older in 2012 was 54.6%, as a result of checking the age distribution of patients at Yonsei University Dental Hospital.³ For a sample size of 264 adults, an estimated total of 484 subjects was required.

The questionnaire was given to all patients who visited the Department of Orthodontics at Gangnam Severance Hospital for regular checkups after active orthodontic treatment between July 25, 2015, and December 30, 2015 (total of 493).

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