

A psychological study of people who seek orthodontic treatment: Comparison with untreated controls

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Abstract

Objective: Improvement in appearance is an important motivation for orthodontic treatment; nevertheless, not all patients with malocclusion seek treatment; therefore, the aim of this study was to compare the psychological state of patients with moderate to severe malocclusion who seek orthodontic treatment with patients who suffer from similar malocclusion but do not seek treatment. **Materials and Methods:** Minnesota multiphasic personality inventory-2 questionnaire which assesses psychological states of people were given to 100 subject with moderate to severe malocclusion who were undergoing orthodontic treatment and 100 subjects with similar malocclusion who did not request orthodontic treatment. All subjects had similar demographic variables. Clinical scales measured by the test included: Hypochondriasis, depression, hysteria, psychopathic deviate, paranoia, psychasthenia, schizophrenia, and hypomania. The questionnaire consisted of 71 questions, and the subjects had to mark “True” or “False” in response. The scores were transformed into T-scores by a trained psychologist. The results were evaluated by independent *t*-test. **Results and Conclusion:** The results of the test showed that both treated and untreated subjects were in similar psychological state and were psychologically normal; therefore, it is likely that other factors affect patients’ willingness for seeking orthodontic treatment rather than their psychological state.

Key words: Malocclusion, minnesota multiphasic personality inventory, orthodontic treatment, psychological test

INTRODUCTION

In recent years, there has been a noticeable increase in demand for seeking orthodontic treatment; nevertheless, not all patients with malocclusion, even those with extreme deviations from normal, seek orthodontic treatment.^[1,2] Both social and cultural factors influence the perceived need for treatment.

One of the most significant effects of a malocclusion is its psycho-social impact on the individual patient.^[3] A person’s dental appearance can have a significant effect on how they feel about themselves. There is little doubt that a poor dental appearance can have a profound psycho-social effect on children and adolescents. Shaw *et al.* found that children were teased more about their teeth than anything else, e.g., clothes, weight, ears.^[4] This results in malocclusion patients being unsure of themselves in social interaction and having lower self-esteem. Adults may be less influenced by peer perceptions and are, generally, more stable in their concerns about appearance compared to adolescents.

In a study of need and demand for orthodontic treatment, Gravely found that girls were more aware of malocclusions than boys and were more prepared to accept treatment.^[5] Gray and Anderson^[6] also found that females had a greater

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desire to accept, undergo, and to be satisfied with orthodontic treatment than males. Bos *et al.* evaluated treated and untreated subjects' attitudes toward orthodontic treatment.^[7] They found that previously treated subjects had more positive attitude toward orthodontics than untreated subjects. They also reported that age, but not gender, was a significant predictor factor for the subject's general attitude toward orthodontics.

A search in the literature shows that no previous study has compared psychological state of people who seek orthodontic treatment and the ones who do not. Therefore, the aim of this study was to compare the psychological state of patients who requested orthodontic intervention with a control group.

MATERIALS AND METHODS

The protocol of the study was approved by the Research Ethics Committee of Arak University of Medical Sciences (AUMS) and the study was performed in accordance with the declarations of Helsinki.

From an initial sample of 420 patients referred to the dental clinic of AUMS, 100 patients from 30 to 20 years old with moderate to severe malocclusion who were undergoing orthodontic treatment were chosen as experimental group and 100 subjects with the same age range and malocclusion but not seeking orthodontic treatment were selected as control group.

As the aim of study was to compare the psychological state of subjects seeking orthodontic treatment with subjects who suffer from similar malocclusion but do not request the treatment, the subjects had to be similar in different aspects such as age, gender, education, and other demographic aspects.

INSTRUMENT

The Minnesota multiphasic personality inventory (MMPI) was introduced by Hathaway and McKinley in 1940. The test earned acclaim for the accuracy of its diagnosis of psychological problems in test subjects and became the most popular clinical personality assessment procedure in use. The original MMPI test included 567 items. The MMPI used in this study was the validated Persian translation of a shorter version of the improved MMPI-2 (71 items).^[8]

There is a total of 71 items on the MMPI-2, which the test-taker responds either "true" or "false." The MMPI-2 used in this study has eight clinical scales that are used to indicate different psychological conditions and three validity scales to measure test-taking attitude and to assess whether the subject took a normal, honest approach to the test. In order to interpret the results, raw scores on the scales are transformed into a standardized metric known as T-scores (mean of 50 and standard deviation of 10). Table 1 shows the definition of each score.

During the diagnostic appointment, the subjects were told that the intent of the questionnaire was to provide information about how they felt about themselves, and were given instructions on how to complete the questionnaire. All statistical analyses were performed using the statistical package for the social sciences (SPSS Inc, version 20, Chicago, IL, USA). Independent *t*-test was used to evaluate the data.

RESULTS

T-scores of >70 are indicative of marked elevation, T-scores of between 50 and 70 are indicative of moderate

Table 1: MMPI-2 clinical and validity scales and definition of T-scores

Scales	T > 50
Clinical	
Hypochondriasis (Hs)	Concern with bodily symptoms
Depression (D)	Depressive symptoms
Hysteria (Hy)	Displaying hysteria in stressful situations
Psychopathic deviate (Pd)	A measure of disobedience. High scorers tend to be more rebellious and fight authority
Paranoia (Pa)	Paranoid symptoms such as suspiciousness, feelings of persecution, grandiose self-concepts, excessive sensitivity, and rigid attitudes
Psychasthenia (Pt)	Excessive doubts, compulsions, obsessions, and unreasonable fears
Schizophrenia (Sc)	Used to identify schizophrenic patients
Hypomania (Ma)	Elevated mood, accelerated speech, and motor activity, irritability, flight of ideas, and brief periods of depression
Validity	
Lie (L)	The testee is lying and trying to present himself/herself in a more positive way
Infrequency (F)	Subjects who score high on this test are trying to appear better or worse than they really are
Correction (K)	The testee is defensive and attempting to hide something

MMPI – Minnesota multiphasic personality inventory

elevation and T-scores of below 50 are considered as normal values. As can be seen in Table 2, all the T-scores of the treated and untreated subjects are well below 70 and the differences between them are not significant. Mean T-score of Hypochondriasis was 33.1 (14.1) in treated group and 33.0 (14.3) in the untreated group. ($P < 0.9$) T-scores of 35.8 (14.4) and 35.2 (13.7) in treated and untreated subjects, respectively, showed that none of the subjects suffered from clear signs of depression. As with the validity scales, none of the subjects were trying to present themselves differently or had any defensive approach toward the test.

DISCUSSION

This study found no difference in personality traits and psychological characteristics between patients who seek orthodontic treatment^[9] and subjects with similar malocclusion who do not request treatment. Since current study is the only MMPI study of orthodontic patients direct comparison with other studies is not possible. In a similar study but done on orthognathic patients, Williams *et al.* assessed personality traits of 30 women who required orthognathic operations and a control group of 30 other women and found that orthognathic patients were psychologically normal except that they had more dissatisfaction with their facial appearance;^[10] thus, they postulated that the desire for operation was caused by a genuine physical abnormality rather than a perceived exaggerated esthetic problem.

Numerous studies have assessed the psychological effects of orthognathic and orthodontic treatment in the same patient.^[11] In a 2-year follow-up study of 61 orthognathic surgery patients, Flanary *et al.* observed a significantly positive effect in the subscales of self-esteem, self-satisfaction, self-identity, physical self, family self, social self, and total self-conflict.^[12] They also mentioned that the improved changes in the psychological profile 2 years after orthognathic surgery were encouraging. In a review of 29 prospective and retrospective studies, Hunt *et al.* found that orthognathic patients experience psychosocial benefits as a result of orthognathic surgery, including improved self-confidence, body and facial image, and social adjustment.^[13] Bos *et al.* also found that subjects who had undergone orthodontic treatment had more positive attitude toward orthodontics than untreated subjects.^[7]

The results found by this study negate our null hypothesis, which was the difference between psychological state of patients who seek orthodontic treatment and the ones who

Table 2: T-scores of treated and untreated subjects for each scale

Clinical and validity scales	Treated subjects Mean (SD)	Untreated subjects Mean (SD)	P
Hypochondriasis	33.1 (14.1)	33.0 (14.3)	0.9
Depression	35.8 (14.4)	35.2 (13.7)	0.7
Hysteria	40.1 (11.3)	40.9 (10.8)	0.6
Psychopathic deviate	34.4 (13.0)	37.5 (14.1)	0.1
Paranoia	31.3 (14.9)	31.2 (15.7)	0.9
Psychasthenia	40.1 (21.0)	37.6 (18.8)	0.3
Schizophrenia	33.9 (14.8)	34.5 (16.7)	0.7
Hypomania	47.0 (17.0)	44.0 (21.0)	0.2
Lie	34.8 (25.0)	34.2 (25.8)	0.8
Infrequency	18.3 (14.5)	18.8 (15.1)	0.9
Correction	46.5 (15.8)	48.2 (16.0)	0.4

P value set at 0.05; SD – Standard deviation

do not; therefore, further tests with different questionnaires are recommended.

CONCLUSIONS

Patients with moderate to severe malocclusion who seek orthodontic treatment are psychologically similar to patients with similar malocclusion who do not request treatment.

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