

Evaluation of the personality traits in subjects in need of orthodontic treatment using the Big Five model: A cross-sectional questionnaire-based study

Tarulatha Shyagali^{1,2,A–D,F}, Ajay Kubavat^{1,2,B,E,F}, Deepak Bhayya^{3,B,C,F}

¹ Department of Orthodontics and Dentofacial Orthopedics, Mathrusri Ramabai Ambedkar Dental College and Hospital, Bengaluru, India

² Department of Orthodontics and Dentofacial Orthopaedics, Faculty of Dental Sciences, Sankalchand Patel University, Visnagar, India

³ Department of Pedodontics and Preventive Dentistry, Mathrusri Ramabai Ambedkar Dental College and Hospital, Bengaluru, India

A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation;

D – writing the article; E – critical revision of the article; F – final approval of the article

Dental and Medical Problems, ISSN 1644-387X (print), ISSN 2300-9020 (online)

Dent Med Probl. 2025;62(1):49–56

Address for correspondence

Tarulatha Shyagali

E-mail: drtarulatha@gmail.com

Funding sources

None declared

Conflict of interest

None declared

Acknowledgements

None declared

Received on February 8, 2023

Reviewed on April 12, 2023

Accepted on April 28, 2023

Published online on February 25, 2025

Abstract

Background. Malocclusion can be regarded as a civilizational disease, and its psychological implications remain a subject of debate.

Objectives. The aim of the study was to examine different personality traits of the individuals with malocclusion using the Big Five personality trait model.

Material and methods. A cross-sectional questionnaire-based study was conducted on 260 individuals with malocclusion, aged 15–24 years. The subjects were examined for the dental health component (DHC) of the index of orthodontic treatment need (IOTN) and graded by an expert orthodontist. The questionnaire contained 44 questions designed to evaluate various personality traits, namely extroversion, agreeableness, conscientiousness, neuroticism, and openness. The subjects were instructed to complete the questionnaire within a designated time frame of 10 min. The collected data was organized and scored. The individuals were then sorted into different categories of personality traits. A descriptive statistical analysis was performed on the collected data, and an analysis of variance (ANOVA) was conducted to determine the difference between the IOTN grading and various personality traits.

Results. All the subjects demonstrated low levels of extroversion, agreeableness and conscientiousness. In comparison to individuals with IOTN grade 1, those with grades 2 and 3 exhibited significantly higher levels of neuroticism ($p < 0.005$). The scores for the openness personality trait were moderate for all IOTN grades. Individuals with a high and moderate need for orthodontic treatment demonstrated elevated levels of neuroticism.

Conclusions. A definite influence of malocclusion on the personality traits of an individual was observed. Subjects requiring more extensive orthodontic treatment exhibited a higher prevalence of neuroticism.

Keywords: IOTN, malocclusion, dental health component

Cite as

Shyagali T, Kubavat A, Bhayya D. Evaluation of the personality traits in subjects in need of orthodontic treatment using the Big Five model: A cross-sectional questionnaire-based study. *Dent Med Probl.* 2025;62(1):49–56. doi:10.17219/dmp/165799

DOI

10.17219/dmp/165799

Copyright

Copyright by Author(s)

This is an article distributed under the terms of the

Creative Commons Attribution 3.0 Unported License (CC BY 3.0)

(<https://creativecommons.org/licenses/by/3.0/>).

Highlights

- The necessity for malocclusion treatment in individuals has been demonstrated to influence personality traits.
- Individuals with a low orthodontic treatment need tend to exhibit personality traits such as extroversion, agreeableness, conscientiousness, and openness.
- Results show that individuals with a moderate to significant need for treatment exhibit features of neuroticism.

Introduction

Malocclusion is a condition characterized by the lack of proper alignment of the teeth. It has been demonstrated to result in reduced oral health-related quality of life (OHRQoL). Many researchers have described this phenomenon in the literature.^{1–3} Malocclusions influence not only the OHRQoL, but also the psychological and mental well-being of a person. A direct correlation between malocclusion and low self-esteem has been demonstrated.^{4,5} Individuals with malocclusion also experience negative body image and the related consequences.⁶ Additionally, appearance can influence social acceptability and the development of positive interpersonal relationships.⁷

With the exception of an article by Lin et al., which reports that individuals with the neuroticism personality trait tend to exhibit low OHRQoL,⁸ there is a paucity of research regarding the personality traits of individuals with malocclusions. There are numerous systems available for the classification of personality traits. However, the Big Five personality trait model has emerged as the most reliable, as it describes broad traits that serve as the foundational elements of personality.^{9,10}

The Big Five personality traits encompass 5 facets: neuroticism; extraversion; openness to experience; agreeableness; and conscientiousness.^{11,12} Neuroticism specifically refers to individuals' tendency to experience anxiety, hostility and impulsivity. Extraversion is defined by individuals' propensity to exhibit enthusiasm, optimism and a high degree of social interaction. Openness to experience indicates a proclivity for innovation and the pursuit of unconventional solutions. Conscientiousness is characterized by the tendency to exercise diligence and self-discipline. Agreeableness reflects an individual's level of trust, altruism and straightforwardness.

The classification or grading of malocclusions can be approached in a variety of ways. Although the most popular way of classifying malocclusions is the Angle's classification, it lacks specificity with regard to the severity of the condition, thereby hindering its application in scientific research. In this regard, the index of orthodontic treatment need (IOTN) is a promising alternative for evaluating the severity of malocclusions.¹³ While the influence of malocclusion on personality traits is an interesting area of research, the existing literature on the subject is limited. Therefore, the present study was conducted with the aim of evaluating the influence of malocclusion on the personality traits of the individuals.

Material and methods

Subjects

A cross-sectional questionnaire-based study was conducted on a sample of 260 individuals with malocclusion, aged 15–24 years. Participants were randomly selected from individuals who visited the Department of Orthodontics and Dentofacial Orthopaedics, Mathrusri Ramabai Ambedkar Dental College and Hospital, Bengaluru, India, for the first time with a desire to treat their malocclusions. All the subjects were informed about the purpose of the study, and written informed consent was obtained for their willing participation. The study received ethical clearance from the Institutional Ethics Committee of Mathrusri Ramabai Ambedkar Dental College and Hospital (approval No. IEC/MRADC&H/EC-014/20223). The sample size was calculated at 90% confidence interval with a 5% margin of error at 50% response distribution using the sample size calculator (Raosoft®; <http://www.raosoft.com/samplesize.html>).

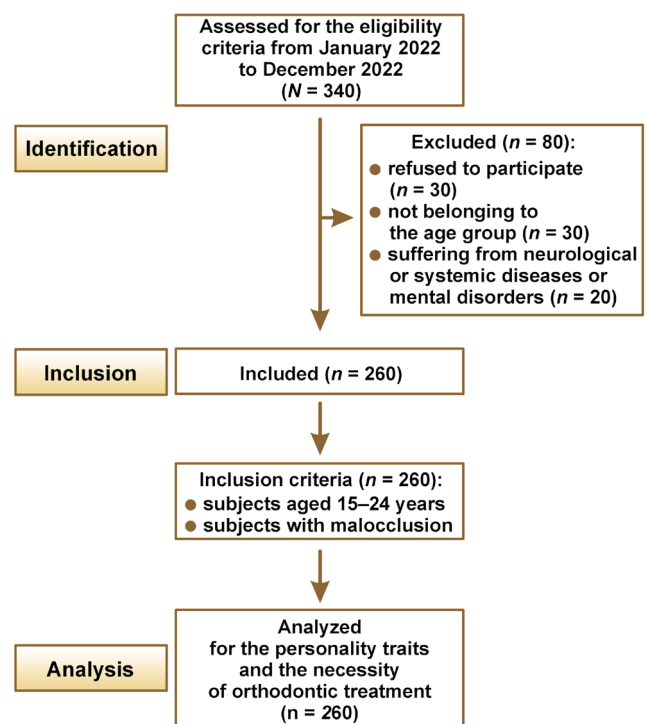


Fig. 1. STROBE (Strengthening the Reporting of OBservational studies in Epidemiology) flowchart of the study

Method

Subjects aged 15–24 years with malocclusion were included in the study. Subjects who were syndromic, not belonging to the age group, unwilling to participate in the study, and those suffering from any neurological or systemic diseases or mental disorders were excluded from the study (Fig. 1).

The dental health component (DHC) of the IOTN¹⁴ was used to classify the subjects into different malocclusion groups (Table 1), as follows:

- groups 1–2 (grade 1): little or no treatment need;
- group 3 (grade 2): moderate to borderline treatment need;
- groups 4–5 (grade 3): definitive need for treatment.

Procedure

Following the provision of written consent, each individual was given a physical copy of a preformed questionnaire to complete. The study employed the Big Five personality trait model, which included a 44-item questionnaire (Table 2) to categorize individuals into different personality traits.¹⁵ The participants were requested to complete the questionnaire within the designated time frame of 10 min. The questionnaire was bilingual (English and Hindi/Kannada) and included items requiring demographic details. The participants were instructed to respond to each question using the 5-point Likert scale, as follows:

- 1: strongly disagree;
- 2: disagree;
- 3: neutral;

- 4: agree;
- 5: strongly agree.

A single examiner (TS) assessed all subjects for the severity of malocclusion on the dental chair using the auto-claved instruments. The grading was noted in the questionnaire intended to be given to the subjects.

Research tool

The Big Five personality trait model is among the most widely used structural personality models.¹⁵ It uses a 44-item questionnaire as a tool to categorize personality traits, and according to the study by Satow,¹⁶ the Big Five questionnaire is used more than 20,000 times every year as a clinical diagnostic aid and guide for career counseling and coaching. The reliability of the questionnaire was evaluated on 21,048 samples with a Cronbach's alpha ranging from 0.76 to 0.90, indicating high reliability of the tool.^{16,17} The Big Five personality trait model proposes 5 broad personality traits based on the answers given to the pre-set questions (Table 2). These traits are openness to experience, extroversion, agreeableness, conscientiousness, and neuroticism (or its positive aspect, emotional stability). Each question is scored according to the Likert scale, and the following scoring criteria are used for different personality traits ("R" denotes reverse-scored items):

- extroversion: 1, 6R, 11, 16, 21R, 26, 31R, 36;
- agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42;
- conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R;
- neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39;
- openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44.

Table 1. Dental health component (DHC) of the index of orthodontic treatment need (IOTN)

IOTN score		5	4	3	2	1
Need for treatment		definitive	great	moderate	little	none
A	Overjet	>9 mm	6–9 mm	3.5–6 mm incompetent lip	3.5–6 mm competent lip	–
B	Reverse overjet (with no masticatory or speech difficulties)	–	3.5–5 mm	1–3.5 mm	<1 mm	–
C	Crossbite	–	>2 mm	1–2 mm	<1 mm	–
D	Tooth displacement	–	>4 mm	2–4 mm	1–2 mm	<1 mm
E	Open bite	–	>4 mm	2–4 mm	1–2 mm	–
F	Overbite	–	increased, complete, with trauma	increased, complete, no trauma	<3.5 mm incomplete, no trauma	–
G	Pre- or postnormal occlusion	–	–	–	½ unit discrepancy	–
H	Hypodontia	>1 tooth per quadrant	less severe	–	–	–
I	Impeded eruption	crowding, displacement, pathology	–	–	–	–
L	Posterior lingual crossbite	–	no functional occlusion	–	–	–
M	Reverse overjet (with reported masticatory or speech difficulties)	3.5–5 mm	1–3.5 mm	–	–	–
P	Cleft lip and palate	defects	–	–	–	–
S	Deciduous teeth	submerged	–	–	–	–
T	Partially erupted teeth	–	impacted	–	–	–
X	Supplemental teeth	–	present	–	–	–

Table 2. Big Five personality trait questionnaire

Item	Likert scale
1. Is talkative	1–5
2. Tends to find fault with others	
3. Does a thorough job	
4. Is depressed or blue	
5. Is original and comes up with new ideas	
6. Is reserved	
7. Is helpful and unselfish with others	
8. Is somewhat careless	
9. Is relaxed and handles stress well	
10. Is curious about many different things	
11. Is full of energy	
12. Starts quarrels with others	
13. Is a reliable worker	
14. Can be tense	
15. Is ingenious and a deep thinker	
16. Generates a lot of enthusiasm	
17. Has a forgiving nature	
18. Tends to be disorganized	
19. Worries a lot	
20. Has an active imagination	
21. Tends to be quiet	
22. Is generally trusting	
23. Tends to be lazy	
24. Is emotionally stable and not easily upset	
25. Is inventive	
26. Has an assertive personality	
27. Can be cold and aloof	
28. Perseveres until the task is finished	
29. Can be moody	
30. Values artistic and aesthetic experiences	
31. Is sometimes shy and inhibited	
32. Is considerate and kind to almost everyone	
33. Does things efficiently	
34. Remains calm in tense situations	
35. Prefers work that is routine	
36. Is outgoing and sociable	
37. Is sometimes rude to others	
38. Makes plans and follows through with them	
39. Gets nervous easily	
40. Likes to reflect and play with ideas	
41. Has few artistic interests	
42. Likes to cooperate with others	
43. Is easily distracted	
44. Is sophisticated in art, music or literature	

To reverse score an item, responses recorded as 1 were assigned a value of 5, responses recorded as 2 were assigned a value of 4, responses recorded as 4 were assigned a value of 2, and responses recorded as 5 were assigned a value of 1. After reverse scoring, the total scores for E (extroversion), A (agreeableness), C (conscientiousness), N (neuroticism), and O (openness) were calculated.

Statistical analysis

In order to evaluate the reliability of the IOTN grading, 10 patients were examined twice within a week, and their data was analyzed using Cohen's kappa, which indicated a high level of reliability (90%). The collected data was organized and tabulated in Microsoft Excel (Microsoft Corp., Redmond, USA) and subsequently subjected to a statistical analysis using the IBM SPSS Statistics for Windows software, v. 28.0 (IBM Corp., Armonk, USA). A one-way analysis of variance (ANOVA) was conducted to evaluate the relationship between different personality traits and the IOTN grading, followed by Tukey's post hoc test to determine the difference between each grade of malocclusion and the personality traits.

Results

A total of 340 subjects were evaluated for the eligibility, out of which 80 subjects were excluded due to various reasons, resulting in a final sample size of 260 (Fig. 1). All subjects met the established inclusion criteria.

The distribution of the study population based on the IOTN DHC grading is outlined in Table 3. The mean age of the study participants was 17.8 ± 1.1 years. Male and female subjects were evenly distributed. Of the 260 subjects, 27 were classified as having a grade 1 treatment need, 105 as having a grade 2 treatment need, and 128 as having a definitive need for orthodontic treatment (grade 3).

The descriptive statistics for the different grades of IOTN and personality traits are depicted in Table 4. The highest levels of extroversion, agreeableness and conscientiousness were observed in patients in the grade 1 IOTN DHC category, with mean values of 19.926, 20.259 and 23.444, respectively. However, neuroticism emerged as the prominent trait in grades 2 and 3, with mean values of 35.857 and 36.320, respectively. All malocclusion groups exhibited comparable levels of openness.

Table 3. Distribution of the study sample ($N = 260$)

Subjects	Size	Grade 1	Grade 2	Grade 3
Male	130	15	51	64
Female	130	12	54	64
Total	260	27	105	128

grade 1 – little or no treatment need; grade 2 – moderate to borderline treatment need; grade 3 – definitive need for treatment. Data expressed as frequency (n).

Table 4. Descriptive statistics for the index of orthodontic treatment need (IOTN) grades and the personality trait scores

Personality trait	Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>
Extroversion	grade 1	27	19.926	5.061	0.974
	grade 2	105	13.638	3.813	0.372
	grade 3	128	10.703	3.973	0.351
Agreeableness	grade 1	27	20.259	4.494	0.865
	grade 2	105	17.914	3.417	0.334
	grade 3	128	16.836	2.926	0.259
Conscientiousness	grade 1	27	23.444	6.647	1.279
	grade 2	105	17.105	5.713	0.558
	grade 3	128	15.555	4.354	0.385
Neuroticism	grade 1	27	27.333	7.380	1.420
	grade 2	105	35.857	4.177	0.408
	grade 3	128	36.320	4.158	0.368
Openness	grade 1	27	29.444	8.750	1.684
	grade 2	105	28.448	9.110	0.889
	grade 3	128	29.914	7.702	0.681

M – mean; *SD* – standard deviation; *SE* – standard error.

Table 5 presents a comparison of individual personality traits with respect to different grades of malocclusion. A statistically significant difference was observed in the occurrence of each personality trait across different malocclusion groups ($p = 0.000$), with the exception of the openness trait, which exhibited comparable levels across all malocclusion grades ($p = 0.414$).

Tukey's post hoc test was used to determine the difference between each grade of malocclusion and the personality traits. The results of this analysis are presented in

Table 6. A significant difference was identified between grades 1 and 2, grades 1 and 3, and grades 2 and 3 for extroversion and agreeableness. For the personality traits of conscientiousness and neuroticism, a significant difference was observed between grades 1 and 2 and between grades 1 and 3. However, there were no significant differences between grades 2 and 3 for these traits. Additionally, there was no significant difference between the grades of orthodontic treatment need for openness.

Discussion

Malocclusion is a deviation from normal or ideal occlusion, which can cause a variety of issues, including functional and aesthetic concerns. With regard to appearance or aesthetics, it can be a potential cause of various psychological issues, including negative body image, low self-esteem, lack of confidence, depression, feeling like an outsider, or social withdrawal.^{18–23} Although malocclusion is known to cause these problems, extensive studies related to the relationship between orthodontic treatment need and personality traits were never pursued. The current study tried to explore the different psychological and personality dimensions of the individuals with malocclusion.

It is a difficult task to attempt to fit individuals into a certain mold of personality. Each person exhibits different characteristics, and the individual's dominant personality is determined by their behavior during different situations. In this regard, the Big Five personality trait model is optimal, as it measures trait continuity in individuals and includes the bipolar trait dimension.²⁴ Therefore, we employed the Big Five model as a tool for studying personality traits of people in need of orthodontic treatment. The validity and reliability of the Big Five

Table 5. Analysis of variance (ANOVA) for the index of orthodontic treatment need (IOTN) grades and the personality trait scores

Personality trait	Source	<i>df</i>	Sum of squares	Mean square	F-stat	<i>p</i> -value
Extroversion	between groups	2	2,007.033	1,003.516	61.658	0.000*
	within groups	257	4,182.824	16.276		
	total	259	6,189.857	–	–	–
Agreeableness	between groups	2	275.857	137.929	12.539	0.000*
	within groups	257	2,826.942	11.000		
	total	259	3,102.800	–	–	–
Conscientiousness	between groups	2	1,389.849	694.925	25.697	0.000*
	within groups	257	6,950.054	27.043		
	total	259	8,339.903	–	–	–
Neuroticism	between groups	2	1,876.880	938.440	44.442	0.000*
	within groups	257	5,426.777	21.116		
	total	259	7,303.600	28.199	–	–
Openness	between groups	2	124.937	62.469	0.884	0.414
	within groups	257	18,156.740	70.649		
	total	259	18,281.680	–	–	–

df – degrees of freedom; * statistically significant ($p < 0.05$).

Table 6. Tukey's post hoc test for the index of orthodontic treatment need (IOTN) grades and the personality trait scores

Personality trait	Pair	Difference of means	SE	Q	Lower CI	Upper CI	Critical mean	p-value
Extroversion	grade 1–2	6.288	0.616	10.215	4.236	8.340	2.052	0.000*
	grade 1–3	9.223	0.604	15.266	7.209	11.237	2.014	0.000*
	grade 2–3	2.935	0.376	7.814	1.683	4.187	1.252	0.000*
Agreeableness	grade 1–2	2.345	0.506	4.634	0.658	4.032	1.687	0.003*
	grade 1–3	3.423	0.497	6.893	1.768	5.079	1.656	0.000*
	grade 2–3	1.078	0.309	3.492	0.049	2.108	1.029	0.038*
Conscientiousness	grade 1–2	6.340	0.794	7.990	3.694	8.985	2.645	0.000*
	grade 1–3	7.890	0.779	10.131	5.294	10.486	2.596	0.000*
	grade 2–3	1.550	0.484	3.202	−0.064	3.164	1.614	0.063
Neuroticism	grade 1–2	8.524	0.701	12.157	6.186	10.861	2.337	0.000*
	grade 1–3	8.987	0.688	13.060	6.693	11.281	2.294	0.000*
	grade 2–3	0.463	0.428	1.083	−0.963	1.886	1.426	0.725
Openness	grade 1–2	0.997	1.283	0.777	−3.279	5.272	4.275	0.847
	grade 1–3	0.470	1.259	0.373	−3.727	4.666	4.196	0.962
	grade 2–3	1.466	0.783	1.874	−1.143	4.075	2.609	0.383

Q – studentized range statistic; CI – confidence interval; * statistically significant ($p < 0.05$).

model questionnaire have been demonstrated in children, adolescents and adults in earlier studies, making it a tool of choice for the current study.^{25–27}

Although malocclusion can be classified in a variety of ways, the Angle's classification is the most common. However, it does not provide an exact idea of how severe the malocclusion is or what the need for treatment is. In light of these considerations, the DHC of the IOTN is a valuable tool for evaluating the necessity of treatment, depending on the severity of the malocclusion.¹⁴ In the present study, the DHC of the IOTN was used to categorize the individuals into groups with little, moderate and definitive need for orthodontic intervention. The evaluation of the personality traits in relation to treatment need revealed that subjects with grades 2 and 3 exhibited higher levels of neuroticism compared to those with grade 1 (low treatment need). In a separate study, Rasooli and Lavasani correlated the body image concept with the 5-factor inventory.²⁸ Their findings revealed a significant positive relationship between neuroticism, agreeableness and openness, as well as a significant negative correlation between conscientiousness and extraversion.²⁸

According to MacNeill et al., high levels of neuroticism are associated with a negative body image in females.²⁹ Malocclusion is related to the oral cavity, affecting an individual's facial and smile aesthetics, which can have a negative impact on their perception of body image. Another article on the correlation between large body type and the Big Five personality trait model demonstrated a significant negative relationship between conscientiousness and body image.³⁰

For all the grades of orthodontic treatment need, extroversion received the lowest mean score, followed by agreeableness, conscientiousness and openness. Neuroticism,

on the other hand, received the highest scores across all orthodontic treatment grades. The comparison between the different grades and the individual personality traits indicates that extroversion was more commonly observed in the grade 1 orthodontic treatment need group, which required little or no need for dental intervention.

The results of the current study demonstrate a significantly higher level of neuroticism in the grade 2 and 3 orthodontic treatment need groups as compared to the grade 1 group. Good dental appearance is a major factor determining the social and psychological well-being of individuals. Subjects with a healthy dentition usually exhibit better psychosocial adjustment and greater intellectual abilities.³¹ As malocclusion affects dental appearance, it has a direct impact on the interpersonal social skills. Thus, individuals with malocclusions tend to exhibit lower levels of extroversion and elevated levels of neuroticism. Similarly, previous studies reported that malocclusion is one of the factors impacting the social success of individuals.^{32,33} Subjects with neuroticism as their dominant personality trait experience emotional instability, irritability, anxiety, lack of self-confidence, depression, and self-consciousness.³⁴ This underscores the significance of orthodontic treatment for grade 2 and grade 3 individuals in order to improve their dental and facial aesthetics. Research has demonstrated that individuals with malocclusion experience an improvement in their OHRQoL following orthodontic treatment.^{35,36}

Nevertheless, Spalj et al. discovered that personality traits do not mediate the self-perceived malocclusion rating,³⁷ which is in contrast to the findings of the present study. A recent study of a similar nature was conducted to assess how personality traits affect the relationship between malocclusion and the psychosocial impact of dental

aesthetics.³⁸ The authors observed that an increase in the severity of malocclusion was associated with higher scores for neuroticism.³⁸ These findings are similar to the results of the present study.

Given the absence of research comparing personality trait changes in malocclusion patients before and after orthodontic treatment, the present study assessed the impact of orthodontic therapy on the individuals' personality traits. Despite the formulation of the inclusion and exclusion criteria to eliminate the confounding factors, the influence of upbringing, socioeconomic conditions and environmental factors may have contributed to the inheritance of these traits in the study sample. Taking each factor into consideration is a tedious task that was beyond the scope of this study. However, it has been clearly established that individuals with poor OHRQoL exhibit higher levels of neuroticism and lower levels of conscientiousness,^{39,40} while individuals who regularly visit the dentist show elevated levels of extraversion, conscientiousness and openness.⁴¹

Interestingly, the openness trait score remained consistent across all grades of orthodontic treatment need. It is safe to assume that the examined sample size was perceptive and open-minded, which enabled them to adapt to the changes.

A notable limitation of the study is the absence of a control group. Additionally, the study could be strengthened by comparing the personality traits of the malocclusion group with those of the normal occlusion group to validate the data. The study did not seek to evaluate the influence of the age group of individuals who required orthodontic treatment on the personality traits. A previous study that evaluated the influence of the years of experience in sports on the personality traits of an individual observed that the levels of extroversion increased in the individuals with more years of experience in the sports, and the levels of neuroticism decreased.⁴² Thus, it might be hypothesized that an individual with malocclusion may adapt to its limitations and not be influenced by the condition negatively or, on the contrary, malocclusion may affect their personality in a negative way. Further in-depth research is necessary to ascertain whether the age of malocclusion patients has an impact on the development of personality traits.

Conclusions

In comparison to the population with low orthodontic treatment need, the grade 2 and grade 3 orthodontic treatment need groups, i.e., those with a moderate to significant need for treatment, exhibited higher levels of neuroticism. Additionally, the grade 1 group exhibiting little or no treatment need displayed the attributes of extroversion, agreeableness, conscientiousness, and openness at a higher level.

Ethics approval and consent to participate

All study participants were informed about the purpose of the study, and written informed consent was obtained for their willing participation. The study received ethical clearance from the Institutional Ethics Committee of Mathrusri Ramabai Ambedkar Dental College and Hospital (approval No. IEC/MRADC&H/EC-014/20223).

Data availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Consent for publication

Not applicable.

Use of AI and AI-assisted technologies

Not applicable.

ORCID iDs

Tarulatha Shyagali  <https://orcid.org/0000-0001-8220-9307>

Ajay Kubavat  <https://orcid.org/0000-0003-2099-9715>

Deepak Bhayya  <https://orcid.org/0000-0001-6488-5942>

References

1. Benson PE. Malocclusion does affect oral health-related quality of life. *Am J Orthod Dentofacial Orthop.* 2020;158(5):630. doi:10.1016/j.ajodo.2020.07.019
2. Alrashed M, Alqerban A. The relationship between malocclusion and oral health-related quality of life among adolescents: A systematic literature review and meta-analysis. *Eur J Orthod.* 2021;43(2):173–183. doi:10.1093/ejo/cjaa051
3. Baskaradoss JK, Geevarghese A, Alsaadi W, et al. The impact of malocclusion on the oral health related quality of life of 11–14-year-old children. *BMC Pediatr.* 2022;22(1):91. doi:10.1186/s12887-022-03127-2
4. Perillo L, Esposito M, Caprioglio A, Attanasio S, Santini AC, Carotenuto M. Orthodontic treatment need for adolescents in the Campania region: The malocclusion impact on self-concept. *Patient Prefer Adherence.* 2014;8:353–359. doi:10.2147/PPA.S58971
5. Zaidi AB, Karim AA, Mohiuddin S, Rehman K. Effects of dental aesthetics on psycho-social wellbeing among students of health sciences. *J Pak Med Assoc.* 2020;70(6):1002–1005. PMID:32810096.
6. Minghui P, Jing K, Xiao D. Effect of body image in adolescent orthodontic treatment [in Chinese]. *Hua Xi Kou Qiang Yi Xue Za Zhi.* 2017;35(5):489–493. doi:10.7518/hxkq.2017.05.008
7. Akpasa IO, Yemitan TA, Ogunbanjo BO, Oyapero A. Impact of severity of malocclusion and self-perceived smile and dental aesthetics on self-esteem among adolescents. *J World Fed Orthod.* 2022;11(4):120–124. doi:10.1016/j.jejwf.2022.05.001
8. Lin F, Ye Y, Ye S, et al. Effect of personality on oral health-related quality of life in undergraduates. *Angle Orthod.* 2018;88(2):215–220. doi:10.2319/051017-322.1
9. Power RA, Pluess M. Heritability estimates of the Big Five personality traits based on common genetic variants. *Transl Psychiatry.* 2015;5(7):e604. doi:10.1038/tp.2015.96
10. Abood N. Big five traits: A critical review. *Gadjah Mada Int J Bus.* 2019;21(2):159–186. <https://search.informit.org/doi/10.3316/informit.624862395960323>. Accessed February 4, 2023.

11. Costa PT, McCrae RR. Personality disorders and the five-factor model of personality. *J Pers Disord.* 1990;4(4):362–371. doi:10.1521/pedi.1990.4.4.362
12. Costa PT, McCrae RR. Domains and facets: Hierarchical personality assessment using the revised NEO personality inventory. *J Pers Assess.* 1995;64(1):21–50. doi:10.1207/s15327752jpa6401_2
13. Khandakji MN, Ghafari JG. Evaluation of commonly used occlusal indices in determining orthodontic treatment need. *Eur J Orthod.* 2020;42(1):107–114. doi:10.1093/ejo/cjz042
14. Brook PH, Shaw WC. The development of an index of orthodontic treatment priority. *Eur J Orthod.* 1989;11(3):309–320. doi:10.1093/oxfordjournals.ejo.a035999
15. Joshanloo M, Rastegar P, Bakhshi A. The Big Five personality domains as predictors of social wellbeing in Iranian university students. *J Soc Pers Relatsh.* 2012;29(5):639–660. doi:10.1177/0265407512443432
16. Satow L. Reliability and validity of the enhanced big five personality test (B5T). 2021. doi:10.31234/osf.io/wsugv
17. Hongyan L, Jianping X, Jiyue C, Yexin F. A reliability meta-analysis for 44 items Big Five Inventory: Based on the reliability generalization methodology. *Adv Psychol Sci.* 2015;23(5):755–765. doi:10.3724/SP.J.1042.2015.00755
18. Agou S, Locker D, Streiner DL, Tompson B. Impact of self-esteem on the oral-health-related quality of life of children with malocclusion. *Am J Orthod Dentofacial Orthop.* 2008;134(4):484–489. doi:10.1016/j.ajodo.2006.11.021
19. de Paula Júnior DF, Santos NCM, da Silva ET, Nunes MF, Leles CR. Psychosocial impact of dental esthetics on quality of life in adolescents. *Angle Orthod.* 2009;79(6):1188–1193. doi:10.2319/082608-452R.1
20. De Baets E, Lambrechts H, Lemiere J, Diya L, Willems G. Impact of self-esteem on the relationship between orthodontic treatment need and oral health-related quality of life in 11- to 16-year-old children. *Eur J Orthod.* 2012;34(6):731–737. doi:10.1093/ejo/cjr088
21. Iranzo-Cortés JE, Montiel-Company JM, Bellot-Arcis C, et al. Factors related to the psychological impact of malocclusion in adolescents. *Sci Rep.* 2020;10(1):13471. doi:10.1038/s41598-020-70482-4
22. Duseja S, Patel K, Parikh H, Kubavat A. Assessment of impacts attributed to malocclusion and psychosocial stress on oral health related quality of life: A cross-sectional study. *J Res Adv Dent.* 2020;10(4):149–154. https://www.researchgate.net/profile/Ajay-Kubavat/publication/352399550_Assessment_of_Impacts_Attributed_to_Malocclusion_and_Psychosocial_Stress_on_Oral_Health_Related_Quality_of_Life_A_Cross-Sectional_Study/links/60c84a3692851c8e6395edc5/Assessment-of-Impacts-Attributed-to-Malocclusion-and-Psychosocial-Stress-on-Oral-Health-Related-Quality-of-Life-A-Cross-Sectional-Study.pdf?_tp=eyJlb25-OZKh0lpj7lmZpcnN0UGFnZSI6InB1YmxpY2F0aW9uliwicGFnZSI6InB1YmxpY2F0aW9uIn19. Accessed February 4, 2023.
23. Soto CJ. Big Five personality traits. In: Bornstein MH, ed. *The SAGE Encyclopedia of Lifespan Human Development*. SAGE Publications, Inc.; 2018.
24. Mann FD, Atherton OE, DeYoung CG, Krueger RF, Robins RW. Big five personality traits and common mental disorders within a hierarchical taxonomy of psychopathology: A longitudinal study of Mexican-origin youth. *J Abnorm Psychol.* 2020;129(8):769–787. doi:10.1037/abn0000633
25. Antoñanzas JL. The relationship of personality, emotional intelligence, and aggressiveness in students: A study using the Big Five Personality Questionnaire for Children and Adults (BFQ-NA). *Eur J Investig Health Psychol Educ.* 2020;11(1):1–11. doi:10.3390/eji-hpe11010001
26. Lounsbury JW, Tatum H, Gibson LW, et al. The development of a Big Five Adolescent Personality Inventory. *J Psychoeduc Assess.* 2003;21(2):111–133. doi:10.1177/073428290302100201
27. Robles-Haydar CA, Amar-Amar J, Martínez-González MB. Validation of the Big Five Questionnaire (BFQ-C), short version, in Colombian adolescents. *Salud Ment.* 2022;45(1):29–34. doi:10.17711/sm.0185-3325.2022.005
28. Rasooli SS, Lavasani MG. Relationship between personality and perfectionism with body image. *Procedia Soc Behav Sci.* 2011;15:1015–1019. doi:10.1016/j.sbspro.2011.03.231
29. MacNeill LP, Best LA, Davis LL. The role of personality in body image dissatisfaction and disordered eating: Discrepancies between men and women. *J Eat Disord.* 2017;5:44. doi:10.1186/s40337-017-0177-8
30. Soohinda G, Mishra D, Sampath H, Dutta S. Body dissatisfaction and its relation to Big Five personality factors and self-esteem in young adult college women in India. *Indian J Psychiatry.* 2019;61(4):400–404. doi:10.4103/psychiatry.IndianJPsychiatry_367_18
31. Azodo C, Ogbomo A. Self-evaluated dental appearance satisfaction among young adults. *Ann Med Health Sci Res.* 2014;4(4):603–607. doi:10.4103/2141-9248.139339
32. Claudino D, Traebert J. Malocclusion, dental aesthetic self-perception and quality of life in a 18 to 21 year-old population: A cross section study. *BMC Oral Health.* 2013;13:3. doi:10.1186/1472-6831-13-3
33. Lukez A, Pavlic A, Trinajstić Zrinski M, Spalj S. The unique contribution of elements of smile aesthetics to psychosocial well-being. *J Oral Rehabil.* 2015;42(4):275–281. doi:10.1111/joor.12250
34. Widiger TA, Oltmanns JR. Neuroticism is a fundamental domain of personality with enormous public health implications. *World Psychiatry.* 2017;16(2):144–145. doi:10.1002/wps.20411
35. Jamilian A, Kiaee B, Sanayei S, Khosravi S, Perillo L. Orthodontic treatment of malocclusion and its impact on oral health-related quality of life. *Open Dent J.* 2016;10:236–241. doi:10.2174/1874210601610010236
36. Demirovic K, Habibovic J, Dzemic V, Tiro A, Nakas E. Comparison of oral health-related quality of life in treated and non-treated orthodontic patients. *Med Arch.* 2019;73(2):113–117. doi:10.5455/medarh.2019.73.113-117
37. Spalj S, Novsak A, Bilobrk P, Katic V, Zrinski MT, Pavlic A. Mediation and moderation effect of the big five personality traits on the relationship between self-perceived malocclusion and psychosocial impact of dental esthetics. *Angle Orthod.* 2016;86(3):413–420. doi:10.2319/032315-1871
38. Trinajstić Zrinski M, Pavlic A, Katic V, Spalj S. Effect of personality traits on the association between clinically assessed malocclusion and the psychosocial impact of dental aesthetics. *Orthod Craniofac Res.* 2023;26(1):62–71. doi:10.1111/ocr.12579
39. Hajek A, König HH. Personality and oral health-related quality of life. Results from an online survey. *BMC Oral Health.* 2022;22(1):463. doi:10.1186/s12903-022-02486-7
40. Oancea R, Timar B, Papava I, Cristina BA, Ilie AC, Dehelean L. Influence of depression and self-esteem on oral health-related quality of life in students. *J Int Med Res.* 2020;48(2):300060520902615. doi:10.1177/0300060520902615
41. Aarabi G, Walther C, Bunte K, et al. The Big Five personality traits and regularity of lifetime dental visit attendance: Evidence of the Survey of Health, Ageing, and Retirement in Europe (SHARE). *Aging Clin Exp Res.* 2022;34(6):1439–1445. doi:10.1007/s40520-021-02051-2
42. Piepiora P, Piepiora Z, Bagińska J. Personality and sport experience of 20–29-year-old Polish male professional athletes. *Front Psychol.* 2022;13:854804. doi:10.3389/fpsyg.2022.854804