Research Article
J Nepal Soc Perio Oral Implantol. 2023 Jul-Dec;7(14):71-6.
DOI: 10.3126/jnspoi.v7i2.63129

Submitted: Dec 15, 2023
Accepted: Jan 19, 2024
Published: Feb 25, 2024

Social Impact and Self-Perception of Malocclusion among Adolescents in a Tertiary Centre of Eastern Nepal

Dr. Nidhi Giri,[1] Dr. Ujwal Gautam[2]

[1]Assistant Professor, Department of Orthodontics, Nobel Medical College Teaching Hospital, Biratnagar, Morang, Nepal;
[2]Research Officer, B P Koirala Institute of Health Sciences, Dharan, Sunsari, Nepal.

ABSTRACT

Introduction: Malocclusion, defined as an improper relationship between teeth in the opposite jaws, has been a prevalent disorder in recent decades. There has been an increased concern about dental appearance during childhood and early adulthood.

Objective: To assess the social impact and self-perception of malocclusion among adolescents and to investigate whether the types and severity of malocclusion have any effect on adolescents' social acceptance.

Methods: A total of 301 participants were chosen from middle and high school with ages ranging from 12 to 19 years. After completion of the questionnaire to assess social impact, all the participants were examined using the Index of Orthodontic Treatment Need (IOTN).

Results: Malocclusion severity has a negative correlation with satisfaction with dental appearance (σ: -0.385; P-value: <0.001). Similarly, the severity of malocclusion has weak positive correlation with treatment needs (σ: 0.156; P-value: 0.007) and social impact (σ: 0.171; P-value: 0.003).

Conclusions: Different subjective domains of social impact and self-perception are influenced by the severity of malocclusion among adolescents visiting tertiary care center in Eastern Nepal.

Keywords: Adolescent; malocclusion; social impact.

INTRODUCTION

Malocclusion, defined as an improper relationship between teeth in the opposite jaws, has been a prevalent disorder in recent decades.[1] There has been an increased concern about dental appearance during childhood, adolescence, and early adulthood.[2] In general, societal forces define the norms for acceptable, normal, and attractive physical appearance.[3]

Physical attractiveness is considered as an important factor that affects social relationships. A person's physical appearance, together with his or her sexual identity, is often the most obvious personal characteristics accessible to others during social interaction.[4,5] During interpersonal interaction, it is most common for individuals to focus on the other person's eyes and mouth and give less attention to other facial characteristics.[6]

The literature shows that most people focus on an individual's eyes and smile. Consequently, having an attractive smile is a large part of perceived beauty and thus social acceptance.[7] The compromised esthetic and functional limitations of malocclusion have a great social impact on building good, stable relationships.[8,9] Adolescents are usually apprehensive about their body image, which is an important part of psychological well-being and social acceptance. Peer rejection may cause several negative behaviors and an isolated social life.[10]

There has been an overwhelming lack of evidence regarding the Nepalese context. This study intends to generate evidence in the Nepalese context in helping dentists to better understand how the patient's subjective opinion on their self-appearance can impact their psychological well-being.

Correspondence
Dr. Nidhi Giri
E-mail: nidhigiri65@yahoo.com

Citation
G Nidhi, Gautam U. Social Impact and Self-Perception of Malocclusion among Adolescents in Eastern Nepal. J Nepal Soc Perio Oral Implantol. 2023 Jul-Dec;7(14):71-6.

OPEN ACCESS CC BY

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution CC BY 4.0 Licence.

METHODS

This was a crosssectional study conducted in the department of Orthodontics at Nobel Medical College Teaching Hospital, Biratnagar, Nepal. All middle and high school students from 12 to 19 years old age visiting the department were prospective participants. Patients having orthodontic treatment needs as determined by IOTN were included in the study whereas students who had craniofacial anomalies and were undergoing orthodontic treatment were excluded from the study. The sample size of the study was 301 adolescents based on total enumeration technique. All participants were informed about the study and written consent was obtained from the parents and verbal assent was obtained from the participants. This study was approved by the ethical committee of the Nobel Medical College Teaching Hospital, Biratnagar, Morang, Nepal (Ref. IRC-NMCTH 624/2022) on May 4, 2022. The study duration lasted for one year, from July 2022 to July 2023.

The questionnaire consisted of seven items. Question one was related to the participant's perceived need for orthodontic treatment. Question two was related to the participant's satisfaction with his or her dental appearance. Similarly questions 3, 4, 5, 6, and 7 asked about the social impact of malocclusion. Each question contained a 4-point Likert scale, ranging from 1, "definitely," ranking down to 4, "not at all." This questionnaire was inspired by the social acceptance questionnaires from study conducted by Mandall et al[11] and Badran SA.[12] The sum of the scores described the self-perceived social impact of malocclusion on the participant. The questionnaire was translated into Nepali language and pre-testing was done in 25 participants prior to the study.

All the participants were then examined by NG using the IOTN DHC (Index for Orthodontic Treatment Needs Dental Health Component) for categorizing the participants' condition, according to the severity of the malocclusion, into five grades: Grade 1: no treatment need; Grade 2: mild/little need; Grade 3: moderate need; Grade 4: severe need; and Grade 5: extreme need of treatment. The type of malocclusion was also recorded using the following parameters: overjet, anterior overbite, anterior cross bite, anterior open bite, crowding and spacing.

Descriptive statistics were presented as mean (SD) or median (IQR) for continuous outcomes while categorical outcomes were presented as frequency (proportion). Association of need for treatment, satisfaction with dental appearance and social impact of malocclusion with patient characteristics and severity of malocclusion were evaluated using appropriate inferential statistics. The level of significance was set at $p<0.05$.

RESULTS

The total sample consisted of 301 students. Out of total sample 119 (39.5%) were males and 182(60.5%) were females, with mean age of 15.33 years. 166 (55.1%) students attended private schools and 135 (44.9%) attended public schools. 158 (52.5%) were high school students whereas 143 (47.5%) were secondary school students. (Table 1)

Table 1: Demographic characteristics of the participants.

Particulars		Frequency n (%)
Age category	12 – 13 years	60 (19.9)
	14 – 15 years	82 (27.2)
	16 – 17 years	120 (39.9)
	≥ 18 years	39 (13)
Gender	Male	119 (39.5)
	Female	182 (60.5)
Level	High School	158 (52.5)
	Secondary	143 (47.5)
Type of school	Private	166 (55.1)
	Public	135 (44.9)

The Likert responses were assessed for domains of need for treatment, satisfaction with dental appearance and social impact of malocclusion through single, single and five items respectively. (Table 2)

Almost half of the study (49.5%) participants had crowding, while 15% had overjet. About 17.6% of the participants had no malocclusion. (Table 3) Majority (29.9%) of the participants had grade 2 malocclusion while grade 5 malocclusion was least prevalent among 10.6% of the participants. (Table 4)

Table 2: Distribution of Likert responses to the questionnaire items.

	Responses n (%)				Likert Scores	
	1	2	3	4	Mean (SD)	Median (IQR)
Domain: Need for treatment						
Do you think you need orthodontic treatment?	30 (10)	52 (17.3)	80 (26.6)	139 (46.2)	3.1 (1.0)	3 (2 – 4)
Domain: Satisfaction with dental appearance						
Are you satisfied with the way your teeth look?	154 (51.2)	72 (23.9)	22 (7.3)	53 (17.6)	1.9 (1.1)	1 (1 – 2.5)
Domain: Social impact of malocclusion						
Do you think having straight teeth makes you more popular?	37 (12.3)	46 (15.3)	108 (35.9)	110 (36.5)	3.0 (1.0)	3 (2 – 4)
Do you think having straight teeth makes you successful in life?	175 (58.1)	66 (21.9)	49 (16.3)	11 (3.7)	1.7 (0.9)	1 (1 – 2)
Have you been told by other people that you need to have your teeth straightened?	72 (23.9)	69 (22.9)	84 (27.9)	76 (25.2)	2.5 (1.1)	3 (2 – 4)
Have you been teased about the appearance of your teeth?	147 (48.8)	124 (41.2)	27 (9)	3 (1)	1.6 (0.7)	2 (1 – 2)
Do you try to avoid smiling because of the appearance of your teeth?	115 (38.2)	175 (58.1)	10 (3.3)	1 (0.3)	1.7 (0.6)	2 (1 – 2)

Table 3: Type of malocclusion among study participants.

Type of malocclusion	Frequency n (%)
Anterior cross bite	12 (4)
Anterior open bite	11 (3.7)
Anterior over bite	6 (2)
Crowding	149 (49.5)
Overjet	45 (15)
Spacing	25 (8.3)
No malocclusion	53 (17.6)

Table 4: Severity of malocclusion among study participants.

Severity of malocclusion	Frequency n (%)
Grade 1	53 (17.6)
Grade 2	90 (29.9)
Grade 3	66 (21.9)
Grade 4	60 (19.9)
Grade 5	32 (10.6)

The subjective domains of need of treatment, satisfaction with dental appearance and social impact of malocclusion were found to have significant association with several patient related characteristics like age, gender, level of education, type of school and type of malocclusion. (Table 5)

The severity of malocclusion had statistically significant association with treatment need, satisfaction with dental appearance and social impact of malocclusion. (Table 6)

Table 5: Association of patient characteristics with need of treatment, satisfaction with dental appearance and social impact of malocclusion.

	Need of treatment			Satisfaction with dental appearance			Social impact of malocclusion		
	Mean (SD)	Median (IQR)	P value	Mean (SD)	Median (IQR)	P value	Mean (SD)	Median (IQR)	P value
Age (in years)									
12 – 13	2.9 (1.1)	3 (2-4)	**0.200**	2.1 (0.9)	2 (1-3)	**<0.001**	2.1 (0.5)	2 (1.6-2.6)	**0.001**
14 – 15	3.3 (0.9)	4 (2-4)		2.3 (1.2)	2 (1-4)		1.9 (0.5)	1.8 (1.6-2.2)	
16 – 17	3.0 (1.2)	3.5 (2-4)		1.8 (1.2)	1 (1-2)		2.2 (0.5)	2.2 (1.8-2.6)	
≥ 18	3.2 (0.5)	3 (3-4)		1.2 (0.4)	1 (1-1)		2.2 (0.4)	2.2 (1.8-2.4)	
Gender									
Male	2.9 (1.2)	3 (2-4)	**0.006**	2.2 (1.3)	2 (1-4)	**0.006**	2.0 (0.5)	2 (1.6-2.4)	**0.048**
Female	3.3 (0.9)	3.5 (3-4)		1.7 (1.0)	1 (1-2)		2.1 (0.5)	2.2 (1.8-2.5)	
Level of Education									
High School	3.1 (1.0)	3 (3-4)	0.926	1.6 (1.1)	1 (1-2)	**<0.001**	2.2 (0.4)	2.2 (1.8-2.6)	**<0.001**
Secondary	3.1 (1.0)	3 (2-4)		2.2 (1.1)	2 (1-3)		2.0 (0.5)	2 (1.6-2.4)	
Type of School									
Private	3.3 (0.9)	4 (3-4)	**<0.001**	1.7 (1.0)	1 (1-2)	**<0.001**	2.2 (0.5)	2.0 (0.5)	**0.009**
Public	2.8 (1.1)	3 (2-4)		2.2 (1.2)	2 (1-3)		2.2 (1.8-2.4)	2.0 (1.6-2.4)	
Type of malocclusion									
Anterior cross bite	4 (0)	4 (4-4)	**<0.001**	1.2 (0.6)	1 (1-1)	**<0.001**	2.9 (0.3)	2.8 (2.8-3)	**<0.001**
Anterior open bite	3.7 (0.9)	4 (4-4)		1.9 (0.5)	2 (2-2)		2.4 (0.3)	2.2 (3-2.8)	
Anterior over bite	4 (0)	4 (4-4)		1.7 (0.5)	2.5 (2.3-3)		2.6 (0.4)	2.5 (2.3-3)	
Crowding	3.5 (0.5)	4 (3-4)		1.1 (0.3)	2.4 (2.2-2.6)		2.4 (0.3)	2.4 (2.2-2.6)	
Overjet	2.3 (0.5)	2 (2-3)		2.3 (0.6)	1.8 (1.5-1.8)		1.7 (0.2)	1.8 (1.5-1.8)	
Spacing	2.5 (0.9)	2 (2-3)		2.2 (0.4)	2 (1.8-2.1)		2 (0.3)	2 (1.8-2.1)	
No malocclusion	2.4 (1.5)	1 (1-4)		4 (0)	1.4 (1-1.8)		1.4 (0.3)	1.4 (1-1.8)	

+ Chi-square test; Bold signifies statistical significance at p<0.05.

Table 6: Association between different domain scores with severity of malocclusion.

	Spearman's rho	P value
Treatment need	0.156	0.007
Satisfaction with dental appearance	-0.385	<0.001
Social impact of malocclusion	0.171	0.003

DISCUSSION

A person's confidence and self-esteem may be impacted by aesthetic concerns caused by malocclusion, particularly when they are self-conscious about the way their smile looks. Furthermore, the way that the alignment of their jaw and teeth affects the appearance of their face may have negative social or psychological effects on certain individuals. It's crucial to remember that every individual can experience malocclusion in a very different way psychologically. Depending on their dental alignment, some people may be extremely confident, while others may be greatly impacted by even small misalignments. It may result in diminished confidence and self-worth when interacting with others. People may be sensitive to how malocclusion affects the aesthetics of their faces because it might be viewed as a component of their entire appearance.[13]

In social situations, some people with malocclusion may experience anxiety or unease, especially while smiling or speaking in front of others. Visible malocclusion may make children and teenagers more vulnerable to bullying and taunting, which can seriously harm their mental health. Some people with malocclusion may steer clear of social events or circumstances where they could be the center of attention in an effort to prevent humiliation or discomfort. Some people could have self-consciousness about the way they look, which might hinder their capacity to build close relationships. In more extreme situations, anxiety or depressive symptoms may be exacerbated by malocclusion-related worries about appearance and social relations. Therefore, it's critical to consider a person's subjective judgment while deciding the necessary course of treatment for malocclusion.[14]

The subjective treatment need of an individual was found to be associated with severity of malocclusion in this study. The findings in Nepalese population are similar to that in Argentine patients where high need for orthodontic treatment was reported among individuals with severe form of malocclusion.[15] The different domains of treatment need, satisfaction with dental appearance and social impact of malocclusion were found to have a statistically significant association with severity of malocclusion in our study. The satisfaction with dental appearance was found to be negatively correlated with the severity of malocclusion. In adolescents, psychosocial impact of dental aesthetics is associated with presence of malocclusion as reported in another study by Iranzo-Cortes et al.[16] The study reported that psychosocial impact can be reduced with having previously worn an orthodontic device.

The different domains of treatment need, satisfaction with dental appearance and social impact of malocclusion, in this study, was found to be significantly associated with age, gender, education status, and school type of the children. Study by Birkeland et al. has shown that factors like differences in social class, economic considerations, individuals' perception of psychosocial benefits, and attitudes to appliances contribute to the perception of the adolescents towards the treatment seeking behavior for orthodontic malocclusion.[17]

Dental Aesthetic Index (DAI) used to determine socially defined esthetic standards among secondary school students revealed significant, negative, weak correlation between adolescents' awareness of malocclusion and satisfaction with personal dental appearance at various malocclusion severity levels.[2] However, this study employed IOTN in determining the orthodontic treatment needs in Nepalese children. Nonetheless, a statistically significant association has been demonstrated between two indices as both indices have demonstrated similar potential to determine orthodontic status of the subjects and their need for orthodontic treatment.[18,19] The DAI is employed for its simplicity in use but has its own limitation as it does not take into account the buccak crossbite, posterior openbite, central line discrepancies, or a deep overbite, factors which may have considerable impact on treatment complexity.

Another study by Dalaie et al showed negative impact of malocclusion severity on the Quality of Life (QoL).[20] A significant correlation between borderline and definite need for orthodontic treatment, determined by IOTN- Dental Health Component (DHC), was observed with Oral health related quality of life measure as assessed by OHIP-14 scores in the study. The study employed OHIP-14 to assess the effects of malocclusion on physical and mental domains of QoL. A significant correlation between OHIP and the degree of malocclusion was found among Albanian

children aged 17-21 years old.[21] The results from a study by Feu et al. showed that Brazilian adolescents who sought orthodontic treatment were found to have lower OHQOL, more severe malocclusions, and reported cosmetic impairments.[22]

The study employed non-probability sampling to enroll the participants which may have introduced a selection bias. Further, enrollment of participants from a tertiary level private hospital with specialty service may have introduced a referral center bias. Nonetheless, this study has provided an insight on the social impact and self-perception of malocclusion among adolescents. Further, it has explored the adolescents' social acceptance of the types and severity of malocclusion.

CONCLUSIONS

Malocclusion can have a negative impact on satisfaction of children with dental appearance. The perceived treatment need is found to be correlated with malocclusion and this perception often increases with complexity of malocclusion as shown in the study. Similarly, malocclusion has a negative social impact which can also increase with the severity.

ACKNOWLEDGEMENT

The authors would like to thank all the participants who gave their valuable time and participated in the study.

Conflict of interest: None

REFERENCES

1. Proffit W, Field H, Sarver D. Contemporary orthodontics. 5th ed. St. Louis: Mosby; 2012;Chapter 1: 2 – 18.
2. Onyeaso CO, Sanu OO. Perception of personal dental appearance in Nigerian adolescents. Am J Orthod Dentofac Orthop. 2005;127:700-6.
3. Naveen KB, Ashok M, Ramesh N, Ravishankar TL. Prevalence of malocclusion and orthodontic treatment need among 12-15 years old school children in Davangere, Karnataka, India. Pakistan Oral and Dental Journal. 2010;30:181–5.
4. Traebert ES, Peres MA. Do malocclusions affect the individual's oral health-related quality of life. Oral Health Prev Dent. 2007;5:3–12.
5. Dion K, Berscheid E, Walster E. What is beautiful is good. J Pers Soc Psychol. 1972;24:285–290.
6. Ioi H, Nakata S, Counts AL. Effects of buccal corridors on smile esthetics in Japanese. Angle Orthod. 2009;79:628–633.
7. Almeida AB, Leite IC, Melgaço CA, Marques LS. Dissatisfaction with dentofacial appearance and the normative need for orthodontic treatment: Determinant factors. Dental Press J Orthod. 2014;19:120-6
8. de Paula Júnior DF, Santos NC, da Silva ET, Nunes MF, Leles CR. Psychosocial impact of dental esthetics on quality of life in adolescents. Angle Orthod. 2009;79:1188-93.
9. Bhatia R, Winnier JJ, Mehta N. Impact of malocclusion on oral health-related quality of life in 10-14 year old children of Mumbai, India. Contemp Clin Dent. 2016;7:445-50.
10. Trivedi K, Shyagali TR, Doshi J, Rajpara Y. Reliability of Aesthetic Component of IOTN in the assessment of subjective orthodontic treatment need. J Adv Dent Res. 2011;2:59-65
11. Mandall NA, Vine S, Hulland R, Worthington HV. The impact of fixed orthodontic appliances on daily life. Community dental health. 2006;23(2):69.
12. Badran SA. The effect of malocclusion and self-perceived aesthetics on the self-esteem of a sample of Jordanian adolescents. The European Journal Of Orthodontics. 2010;32(6):638-44.
13. Mayo KH, Vig KD, Vig PS, Kowalski CJ. Attitude variables of dentofacial deformity patients: demographic characteristics and associations. J Oral Maxillofac surg. 1991;49(6):594-602.
14. De Oliveira CM, Sheiham A. The relationship between normative orthodontic treatment need and oral health‐related quality of life. Community dentistry and oral epidemiology. 2003;31(6):426-36.
15. Peláez AN, Mazza SM. Need for orthodontic treatment according to severity of malocclusion in adult patients. Odontoestomatología. 2015;17(26):12-23.
16. Iranzo-Cortés JE, Montiel-Company JM, Bellot-Arcis C, Almerich-Torres T, Acevedo-Atala C, Ortolá-Siscar JC, et al. Factors related to the psychological impact of malocclusion in adolescents. Scientific Reports. 2020;10(1):13471.
17. Birkeland K, Bøe OE, Wisth PJ. Orthodontic concern among 11-year-old children and their parents compared with orthodontic treatment need assessed by index of orthodontic treatment need. Am J Orthod Dentofac Orthop. 1996;110(2):197-205.
18. Padisar P, Naseh R, Babakhani A, Jalayer S. Comparing Dental Aesthetic Index (DAI) and IOTN in determining the orthodontic treatment needs of Qazvin students. Iran J Orthod. 2016;11(2):1-6.
19. Jenny J, Cons NC. Comparing and contrasting two orthodontic indices, the Index of Orthodontic Treatment Need and the Dental Aesthetic Index. Am J Orthod Dentofac Orthop. 1996;110(4):410-6.
20. Dalaie K, Behnaz M, Khodabakhshi Z, Hosseinpour S. Impact of malocclusion severity on oral health-related quality of life in an Iranian young adult population. Euro J Dent. 2018;12(01):129-35.
21. Toti Ç, Droboniku E, Kaçani G, Tepedino M, Meto A, Fiorillo L, et al. Benefits in Oral Health during Orthodontic Treatment of Patients Aged 17 to 21 Years. Euro J Dent. 2023; 17(02): 374-380
22. Feu D, de Oliveira BH, de Oliveira Almeida MA, Kiyak HA, Miguel JA. Oral health-related quality of life and orthodontic treatment seeking. American Journal of Orthodontics and Dentofacial Orthopedics. 2010;138(2):152-9.