



Research Article

## Association of self-esteem with perceived orthodontic treatment need and oral health-related quality of life among 12-15 years schoolchildren - A cross-sectional study

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### ABSTRACT

**Objectives:** The objective of the study was to assess the association of self-esteem (SE) with perceived orthodontic treatment need and oral health-related quality of life (OHRQoL) among 12–15 years old schoolchildren in Bengaluru city, India.

**Materials and Methods:** A cross-sectional study was conducted among 400 schoolchildren aged 12–15 years in Bengaluru city, India. The data were collected on a structured pro forma that included demographic profile, perceived orthodontic treatment need questionnaire, Child Oral Health Impact Profile (COHIP), and the modified version of the Harter's self-perception profile rated by the children. ANOVA, Chi-square test, and multivariate linear analysis models were used.  $P < 0.05$  was considered as statistically significant.

**Results:** The mean age of the study group was  $13.21 \pm 1.08$  years. Most of the study participants were female (53%). Among the participants, 67% perceived orthodontic treatment need. Mean scores for COHIP and SE were  $38.3 \pm 10.7$  and  $91.5 \pm 8.3$ , respectively. In multivariate linear regression analysis, SE was significantly associated with OHRQoL (0.161 [95% confidence interval CI 0.086–0.235]) and perceived orthodontic need [ $-0.701$  (95% CI  $-1.252, -0.151$ )].

**Conclusion:** In this study, orthodontic treatment needs influenced SE and OHRQoL in the children. Hence, early diagnosis and prompt treatment can improve SE and OHRQoL.

**Keywords:** Children, Oral health-related quality of life, Self-esteem, Perceived orthodontic treatment needs

### INTRODUCTION

Oral health has a substantial impact on general health and well-being. Adolescent children have distinctive oral health needs due to a potentially high caries rate, increased risk for traumatic injury, an increased esthetic desire and awareness, and unique social and psychological needs.<sup>[1]</sup> Adolescence is a transitional stage of physical and psychological human development, closely associated with the teenage years. The vast majority of the world's adolescents live in developing countries.<sup>[2]</sup> The facial features play a major role in self perceived appearance during adolescence. Their social relationship is directly dependent on physical attractiveness, and hence, esthetic alteration can have a direct impact on self-esteem (SE) and ultimately quality of life.<sup>[1]</sup>

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Social psychology is affected physical appearance, self-concept, and social acceptance of individuals. SE is the major constituent of self-concept which can be understood as sum of one's self confidence, self-worth, and self-respect.<sup>[1]</sup> The individual's health along with other influencing factors plays a key role in building the SE dimension.<sup>[3]</sup> Oral health being an integral part of general health can also influence the level of SE, which has been widely recorded using Rosenberg's SE scale. SE is described as the subjective ability to deal with the environment and is impacted by the interactions with others. It is an individual's subjective evaluation of their own worth. SE encompasses beliefs about oneself as well as emotional states, such as triumph, despair, pride, and shame.<sup>[4]</sup>

Malocclusion is a common finding, and the consequences are physical, economical, social, and psychological. It is not a disease but rather a deviation from the esthetic norm. Self-perceived dental appearance has always been important in the decision to seek orthodontic treatment.<sup>[5]</sup> They can impair the quality of life in many people and affect various aspects of life, including function, appearance, and interpersonal relationships.<sup>[6]</sup>

Oral health-related quality of life (OHRQoL) is the most commonly used patient-reported outcome measure in dental research. It measures the subjective impact of one's own oral health on daily life in different domains, including oral symptoms, functional well-being, and socioemotional well-being.<sup>[4]</sup>

Studies have reported the association between malocclusion and OHRQoL<sup>[4-6]</sup> and also the role of SE in their relationships.<sup>[1,3,4-6]</sup> However, there are limited studies reporting association between perceived orthodontic needs, OHRQoL, and SE in India. Hence, the study was conducted with the objective to assess the SE, perceived orthodontic treatment need, and OHRQoL and to determine their association among 12–15-year-old schoolchildren in Bengaluru city, Karnataka, India. The research hypothesis stated that orthodontic treatment needs influence SE and OHRQoL in the children.

## MATERIALS AND METHODS

A cross-sectional study was conducted among 400 schoolchildren aged between 12 and 15 years from July 2019 to December 2019 in Bengaluru, Karnataka, India. The intended study protocol was submitted to the Institutional Ethical Committee, of the teaching dental institution and the ethical clearance was obtained. Prior permission was obtained from the head of school managements, Bengaluru, Karnataka, India. The study subjects were informed about the purpose and procedure of the study and were assured that their participation is purely voluntary. The written informed consent and assent were obtained from the study subjects. This study

was carried out in accordance with the ethical standards of World Medical Association for human experimentation 2008 version of Helsinki Declaration.<sup>[7]</sup>

Earlier studies have reported the prevalence of malocclusion ranging from 25% to 50%.<sup>[4-6]</sup> The sample size estimated was 384 which was rounded off to 400. A cluster random sampling design was employed to recruit 400 children. Bengaluru city was divided into four zones (East, West, North, and South). From each zone, four schools were selected randomly. The sample size was achieved based on the eligibility criteria.

Study tools included a structured proforma to collect children's demographic profile and questionnaires on assessment of SE using Harter's self-perception profile for children,<sup>[8,9]</sup> perceived orthodontic treatment need using a question, and OHRQoL using Child Oral Health Impact Profile (COHIP) short form-19.<sup>[10]</sup> The pre-validated questionnaires were subjected to cross-cultural validation by means of back translation (English to Kannada) method with help of linguistic experts.

Perceived orthodontic treatment need was measured with the question "Do you want to get the braces?"<sup>[4]</sup> The children answered the question on a 5-point Likert scale, with an answer possibilities ranging from "strongly disagree" to "strongly agree." For the data analysis, answers are categorized into perceived need (strongly/somewhat agree and do not agree/do not disagree) versus no need (strongly/somewhat disagree).

OHRQoL was measured with a 19-item version of the COHIP-19.<sup>[10]</sup> The questions of the COHIP version were answered on a 5-point Likert scale (never, almost never, sometimes, fairly, and almost all) and covered three domains of children's oral health: Oral symptoms, functional well-being, and socioemotional well-being of the child. All answers were added up to a final OHRQoL scores with the highest score indicating the poor quality of life.

Modified version of the Harter's self-perception profile for children was used.<sup>[9]</sup> Six subscales/domains of the SE scale were used: Scholastic competence (six items), social competence (six items), athletic competence (six items), physical appearance (six items), behavioral conduct (six items), and global self-worth (six items). Each item had two parts and each part had two options ("really true for me" or "sort of true for me"). The children answered the questions of the SE scale after determining the part applicable to them and chose either of the options. All the answers were added up to a final SE score or SE subscale score, respectively, with the highest score indicating the highest SE.

Data were collected from study participants at respective schools during school hours. Schoolchildren aged 12–15 years present on day of the data collection were included and those who have undergone or undergoing orthodontic

treatment were excluded from the study. The questionnaires were distributed to the study participants after giving instructions at the school. The completed questionnaires were collected on the following day answered by study participants and checked for completeness.

The statistical analysis was done with the SPSS version 16 software package (IBM Corporation, SPSS Inc., Chicago, IL, USA). Descriptive statistics with frequency, mean, and standard deviation were computed. ANOVA, Chi-square test, and multivariate linear regression analysis were applied and statistical significance was considered at  $P < 0.05$  (confidence interval [CI] of 95% was taken).

## RESULTS

The age-wise distribution of the study participants was almost equal with the mean age of  $13.4 \pm 1.1$  years and majority were females (53.3%) [Table 1].

Majority of the study participants perceived orthodontic needs (67%) with highest perception in the age group of 15 years. There was no statistically significant difference in the perception among the age groups ( $P = 0.93$ ) [Table 2].

Mean scores for COHIP among the study participants were  $38.3 \pm 10.7$  with the highest scores in 12 years age group  $39.0 \pm 11.2$ . There was no statistically significant difference among the age groups ( $P = 0.64$ ) [Table 3]. Mean scores for SE among the study participants were  $91.5 \pm 8.3$  with the highest scores in 13 years age group. There was no statistically significant difference among the age groups ( $P = 0.73$ ) [Table 4].

Perceived orthodontic needs and COHIP were found to have statistically significant association while using multivariate linear regression analysis models considering SE as dependent variable ( $P < 0.001$ ). SE was significantly associated with OHRQoL [0.161 (95% CI 0.086–0.235)] and perceived orthodontic needs ( $-0.701$  [95% CI  $-1.252, -0.151$ ]).

### In model 1

There was no significant association between age and gender with SE with unstandardized coefficient (B) being  $-0.251$  (95% CI  $[-0.971, 0.469]$ ) ( $P = 0.095$ ) and standardized coefficient of  $-0.34$  for age and unstandardized coefficient (B) being  $0.665$  (95% CI  $[-1.002, 2.332]$ ) ( $P = 0.017$ ) and standardized coefficient of  $0.39$  for gender. The multiple correlation coefficient (R) 0.051, coefficient of determination ( $R^2$ ) 0.003, and adjusted  $R^2$  ( $-0.002$ ) were not statistically significant ( $P = 0.592$ ).

### In model 2

COHIP and perceived orthodontic needs were found to have statistically significant association with SE with

**Table 1:** Distribution of the study participants according to age and gender.

Variables	Total N=400 n(%)
Age (years)	
12	115 (28.7)
13	91 (22.8)
14	96 (24)
15	98 (24.5)
Mean	$13.4 \pm 1.1$
Gender	
Males	171 (42.7)
Females	229 (53.3)

**Table 2:** Number and percentage of perceived orthodontic needs among the study participants ( $n=400$ ).

Age (years)	No perceived orthodontic needs	Perceived orthodontic needs	Total
12	42 (10.5)	73 (18.25)	115 (28.7)
13	29 (7.25)	62 (15.5)	91 (22.8)
14	31 (7.75)	65 (16.25)	96 (24)
15	31 (7.75)	67 (16.75)	98 (24.5)
Total (%)	133 (33.25)	267 (66.75)	400 (100)

\* $P=0.93$

**Table 3:** Mean scores of COHIP scale responded by the study participants ( $n=400$ ).

Age (years)	Domain 1	Domain 2	Domain 3	Overall Mean $\pm$ SD
12	$10.6 \pm 4.8$	$7.1 \pm 3.7$	$21.1 \pm 6.2$	$39.0 \pm 11.2$
13	$10.7 \pm 4.3$	$7.0 \pm 4.1$	$19.9 \pm 5.8$	$37.7 \pm 10.6$
14	$10.6 \pm 4.4$	$7.6 \pm 3.5$	$19.5 \pm 6.4$	$37.9 \pm 10.2$
15	$10.1 \pm 4.2$	$8.2 \pm 3.3$	$20.0 \pm 7.0$	$38.4 \pm 10.8$
Mean	$10.5 \pm 4.4$	$7.5 \pm 3.7$	$20.2 \pm 6.4$	$38.3 \pm 10.7$

\* $P=0.64$

unstandardized coefficient (B) being 0.161 (95% CI [0.086–0.235]) ( $P = 0.00$ ) and standardized coefficient of 0.206 for COHIP and unstandardized coefficient (B) being  $-0.701$  (95% CI  $[-0.1252, -0.151]$ ) ( $P = 0.001$ ) and standardized coefficient of  $-0.122$  for perceived orthodontic needs. The multiple correlation coefficient (R) 0.247, coefficient of determination ( $R^2$ ) 0.061, and adjusted  $R^2$  (0.051) were statistically significant ( $P = 0.000$ ) [Table 5].

## DISCUSSION

SE refers to a person's general sense of worth or acceptance. It has become a household word. Teachers, parents, therapists, and others have focused efforts on boosting SE, as high SE

**Table 4:** Mean scores of self-esteem scale responded by the study participants (n=400).

Age (years)	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Overall Mean±SD
12	15.4±1.7	15.4±1.6	15.1±1.8	15.3±1.8	15.1±1.8	15.0±1.8	91.6±8.2
13	15.5±1.4	15.4±1.5	15.1±1.6	15.4±1.7	15.1±1.5	15.4±1.6	92.1±6.8
14	15.4±1.4	15.4±1.8	14.9±1.8	15.3±1.9	14.9±1.8	15.2±1.8	91.3±8.9
15	15.2±1.4	15.3±1.8	15.0±1.7	14.9±1.8	15.1±1.8	15.2±1.8	91.0±9.3
Mean	15.4±1.5	15.4±1.7	15.0±1.7	15.2±1.8	15.0±1.8	15.2±1.7	91.5±8.3

\*P=0.73

**Table 5:** Multivariate linear regression analysis models with self-esteem as dependent variable among the study participants.

	Unstandardized coefficient B	Standardized coefficient β	P	95% CI (B)	
<b>Model 1</b>					
Constant	94.53		0.000	84.80	104.26
Age	-0.251	-0.34	0.095	-0.971	0.469
Gender	0.665	0.39	0.017	-1.002	2.332
<b>Model 2</b>					
Constant	89.71		0.034	79.64	99.77
Age	-0.232	-0.032	0.127	-0.933	0.469
Gender	0.903	0.53	0.049	-0.722	2.528
COHIP	0.161	0.206	0.00	0.086	0.235
Perceived orthodontic needs	-0.701	-0.122	0.01	-1.252	-0.151
<b>Models</b>	<b>R</b>	<b>R square</b>	<b>Adjusted R square</b>	<b>R square change</b>	<b>P value</b>
1	0.051	0.003	-0.002	0.003	0.592
2	0.247	0.061	0.051	0.058	0.000

1. Predictors: (Constant), gender, age. 2. Predictors: (Constant), gender, age, COHIP, Perceived orthodontic needs

will cause many positive outcomes and benefits. People high in SE claim to be more likable and attractive, to have better relationships, and to make better impressions on others than people with low SE.<sup>[11]</sup> It was found that various dental disorders such as malocclusion and untreated decay cause a profound impact on esthetics and psychosocial behavior of the children, thus affecting their SE.<sup>[12]</sup> Studies on SE, OHRQoL, and perceived orthodontic needs among the 12–15 years age groups are compared. Hence, interpretation should be done with caution.

Adolescence is a stage of life that offers the potential to prevent both current impairment and future illness and promoting successful development into productive adulthood.<sup>[13]</sup> In the current study among 12–15 years, the mean age (13.4 ± 1.1 years) is in line with earlier studies.<sup>[5,14–18]</sup> Majority were females in the present study (53.3%) which is in accordance with four studies,<sup>[4,14–15,17]</sup> whereas, three studies reported majority of males.<sup>[5,16,18]</sup>

Dental esthetics play a key role in adolescents' life, affecting their SE level.<sup>[19]</sup> It is assumed that there is a direct relationship between malocclusion and OHRQoL, without taking into account other factors that might influence this relationship, such as the age, gender, individual's psychological well-being,

or their socioeconomic status (SES). Few studies<sup>[14–15]</sup> found that subjects who perceive their teeth as less attractive tend to have a lower SE.

Other studies<sup>[4,5]</sup> indicated that relationship between subjective orthodontic need and OHRQoL is not based on the SE of children. In this study, there was a significant association of SE with perceived orthodontic needs and OHRQoL among the study participants. Some studies<sup>[16–18]</sup> found a significant correlation between OHRQoL and SE. This could be due to the fact that minor irregularities may be very disturbing for some people, while severe malocclusion may not be of any concern for others.

Perhaps, adolescent SE is more related to interpersonal performance and by understanding adolescent self-concept, demonstrable treatment effects would depend on treatment-related changes in self-protective strategies and social interaction outcomes. The full context of adolescent social development needs to be considered in decisions related to orthodontic treatment for young people.

As the current study is mainly based on the study participants' responses to the questionnaires, it is possible that individual replies are influenced by social desirability bias, response

style and the same response bias to the respective questions, leading to an over or underestimation of the responses. Further, it is possible that individual replies are influenced by social desirability bias, response style and that the same response bias to the respective questions, leading to an over or underestimation of the responses.

However, the cross-sectional design of the present investigation prevents establishing any causal relationship between dental disorders and SE. Studies with longitudinal design are advocated to have a better understanding regarding the psychological concept of this age group with special needs.

## CONCLUSION

The results of the present study indicated OHRQoL and perceived orthodontic need, had a significant association with SE among the schoolchildren. Based on these findings, the psychosocial problems of an unattractive dental appearance should not be overlooked. Moreover, implementing esthetic self-evaluation methods may be a useful tool to consider when prioritizing orthodontic treatment modalities.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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