Original Article

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Dentistry Section

Prevalence of Malocclusion and its Psycho-Social Impact among 12 To 15-Year-old School Children in Lucknow City

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ABSTRACT

Background: Facial aesthetics affects how people are perceived by society and how they perceive themselves. Anterior malocclusion can have an impact on the overall facial appearance.

Aim: The aim of the study was to assess the prevalence of malocclusion and its psycho-social impact among 12 to 15 yrs old school children in Lucknow city.

Materials and Methods: The study consisted of collection of information for psychosocial assessment using a questionnaire and clinical examination of malocclusion. Data regarding psychosocial impact of dental aesthetics was collected using a Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) given by Klages et al., (2006).

Results: 15.57% children belonged to the definite malocclusion category and 5.41% to the handicapped malocclusion category. The mean Dental self confidence score differed significantly among both male ($p \leq 0.001$) and female children ($p \leq 0.001$) across the age groups. The mean Social impact score did not differ significantly among both male ($p \leq 0.31$) and female children ($p \leq 0.12$) across the age groups.

Conclusion: The results of the present study imply that dental aesthetics had a significant impact on the psychosocial aspects of human life irrespective of the gender.

Keywords: Aesthetics, Orthodontic treatment, Dental aesthetic index

INTRODUCTION

Aesthetics is the key element in social interaction. The development of aesthetic awareness begins very early in childhood with the attitude that "what is beautiful is good" [1]. Facial aesthetics affects how people are perceived by society and how they perceive themselves. Aesthetics includes the appearance of an individual and the dentition plays an important role in facial appearance. Anterior malocclusion can have an impact on the overall facial appearance [2].

During adolescence physical appearance takes on significant importance. There is full identification with one's peer group, along with the search for identity and a place in society [3]. In such context, it is important to have a greater comprehension of the psychosocial aspects of malocclusions (including crowding, spacing, missing teeth, anterior maxillary and mandibular irregularities, increased or decreased overjet and openbite) such as dental self confidence and social behavior and their repercussions on the quality of life of adolescents, addressing the issue as a public health problem. Information on this issue may favour a better assessment of treatment needs and priorities as well as contribute towards a better planning of the resources necessary for access to orthodontic treatment on part of the population. So, this study was aimed to assess the prevalence of malocclusion and its psycho-social impact among 12 to 15 y old school children in Lucknow city.

MATERIALS AND METHODS

A cross- sectional study was designed, spanning from January to May 2011, to assess the prevalence of malocclusion and its psycho-social impact on urban school children aged 12-15 yrs of Lucknow city, India.

Multi-stage stratified cluster random sampling technique was employed. In the first stage, Lucknow City was divided geographically into four zones i.e. East, West, North & South. Approximately 22 wards came under each of these geographic zones. In the second stage, one ward was randomly selected from each geographical zone. Out of the four wards, two schools (one private and one public school) from each ward were selected. A class list was obtained from each of the school with proper representation of each age.

Children who had undergone or were undergoing orthodontic treatment and children with a history of psychiatric treatment were excluded.

A pilot study was carried out first on 60 subjects to check for the validity of the questionnaire and operational feasibility of the study. Cronbach's alpha was applied for the reliability of the questionnaire and it was found to be 0.84.

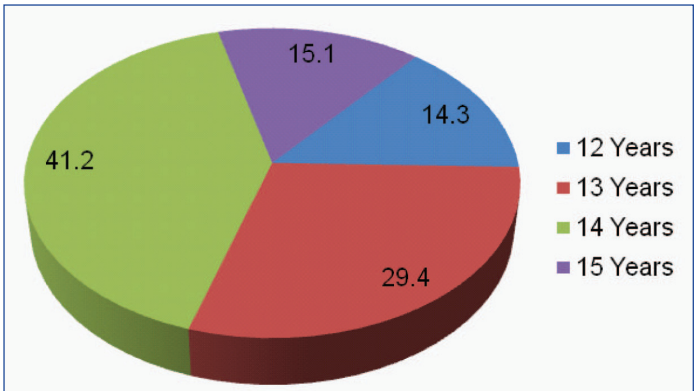
Sample size was calculated using the standard formula seeking results at 95% confidence level for which the value of z = 1.96, the allowable error (e) taken as 0.05. Thus using the above mentioned formula, pilot study was conducted and the prevalence of the disease, sample of 697 school going students was obtained.

This study was reviewed by the institutional ethical committee. Necessary permission was obtained from the Government authorities and the heads of schools.

A written informed consent was obtained from the parents of the children to be examined before the commencement of the study.

A single investigator interviewed and examined the subjects. Study consisted of collection of information for psychosocial assessment using a questionnaire and clinical examination of malocclusion.

Before the start of the survey, the guide calibrated the investigator regarding the WHO criteria for diagnosing the malocclusion in the Department of Public Health Dentistry. A group of 70 subjects (10 % of the total sample) were selected and examined who possessed collectively the full range of conditions expected to assess in the survey. Subjects were re-examined on successive days using the same clinical criteria. By comparing the results of the two examinations, the examiner was able to obtain an estimate of the



[Table/Fig-1]: Age-wise distribution of children

Dental Aesthetic Index scores (DAI)	Age in Years				Total	Perce-ntage (%)
	12 n (%)	13 n (%)	14 n (%)	15 n (%)		
< 25 Normal/Minor malocclusion	74(74.00)	159(77.56)	165(57.49)	87(82.86)	485	69.6
26-30 Definite malocclusion	14(14.00)	38(18.54)	53(18.47)	18(17.14)	123	17.6
31-35 Severe malocclusion	12(12.00)	6(2.93)	48(16.72)	0	66	9.5
35+ Handicapping malocclusion	0	2(0.98)	21(7.32)	0	23	3.3
Total	100(14.31)	205(29.41)	287(41.18)	105(15.06)	697	100.00

[Table/Fig-2]: Distribution of subjects according to age and DAI scores
X^2= 71.82 , p ≤ 0.001

Dental Aesthetic Index scores (DAI)	Gender		Total
	Male n(%)	Female n(%)	
< 25 Normal/Minor malocclusion	298(64.78)	187(78.90)	485
26-30 Definite malocclusion	81(17.61)	42(17.72)	123
31-35 Severe malocclusion	60(13.04)	6(2.53)	66
35+ Handicapping malocclusion	21(4.57)	2(0.84)	23
Total	460(65.99)	237(34.00)	697

[Table/Fig-3]: Distribution of subjects according to gender and DAI scores
X^2= 29.30, p ≤ 0.001

extent and nature of the diagnostic variability. If the variability was large, the examiner reviewed the interpretation of the criteria and conducted additional examinations until acceptable consistency is achieved. Kappa statistic was used to assess the intra-examiner reliability and the kappa coefficient was estimated to be 0.86.

The components of the proforma were:

a) General information

b) Questionnaire

c) Clinical examination of malocclusion using Dental Aesthetic Index (DAI)

The first part had general information of subjects regarding demographic variables which included name, age, gender, educational status.

Data regarding psychosocial impact of dental aesthetics was collected using a Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) given by Klages et al., [4]. It contains 23 items, 6 items from the Self-confidence Scale, 8 items from the Social Aspects Scale of the Orthognathic Quality of Life Questionnaire

Age (In Years)		Dental self confidence score (Mean ± SD)
12	M	12.68 ± 4.41
	F	11.82 ± 3.74
13	M	11.50 ± 4.40
	F	13.65 ± 4.96
14	M	14.47 ± 4.31
	F	15.49 ± 5.77
15	M	17.17 ± 2.93
	F	15.50 ± 1.99

[Table/Fig-4]: Age and gender-wise distribution of children in relation to mean Dental self confidence scores, *p ≤ 0.001 for males, p ≤ 0.001for females , X^2 = 29.30*

Age (In Years)		Social impact scores (Mean ± SD)
12	M	7.77 ± 4.36
	F	8.15 ± 4.31
13	M	8.78 ± 6.07
	F	6.79 ± 4.27
14	M	8.92 ± 5.13
	F	8.26 ± 4.61
15	M	7.95 ± 5.68
	F	7.63 ±4.46

[Table/Fig-5]: age and gender-wise distribution of children in relation to mean Social impact mean scores
p ≤ 0.31 for males, p ≤ 0.12 for females

(OQLQ). These items were evaluated using a five-point Likert scale with numerical values 0= 'not at all', 1= 'a little', 2 = 'somewhat', 3 = 'strongly' and 4 = 'very strongly'.

The children were allowed to sit on a chair and a total number of 25-30 children were examined per day. Questions were asked by the examiner as per the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) given by Klages et al., [4]. The responses were recorded by the examiner himself using the appropriate codes.

The examination for malocclusion was made using the Dental Aesthetic Index (DAI) which is a part of the WHO Oral Health Assessment Form [5]. Type III examination was done using the Community Periodontal Index probe and plane mouth mirror under adequate natural light in school premises.

Disposable mouth masks and gloves were used by the examiner during examination. Autoclaved clinical examination instruments of 25 sets were carried for clinical examination.

Chemical method of disinfection was followed using the solution of Korsolex (Gluteraldehyde – 7.0 gm; 1-6 dioxyhexane – 8.2 gm and polymethyl urea derivative – 11.6 gm) diluted by adding 1 part to 9 parts of potable water for 15 min.

Statistical analysis was done using S.P.S.S version 16.0 software. Statistical tests used were Chi-square and ANOVA.

RESULTS

Out of the 697 children examined, there were 66% (460) males and 34.0% (237) females.

[Table/Fig-1] shows the distribution of study population according to age. The mean age of the children examined was 13.56 ± 0.91 y.

[Table/Fig-2] depicts the distribution of children according to age and Dental Aesthetic Index (DAI) scores. Among 12 yrs age group majority (74%) of the children had Normal/Minor malocclusion. Among 13 yrs age group majority (77.56%) of the children had Normal/Minor malocclusion. Among 14 yrs age group majority (57.49%) of the children had Normal/Minor malocclusion. Among 15 yrs age group most (82.86%) of the children had Normal/Minor

malocclusion. Definite and severe malocclusion was higher in 13 yrs and 14 yrs age group (p ≤ value = 0.001).

[Table/Fig-3] depicts the distribution of children according to gender and Dental Aesthetic Index (DAI) scores. Among males, majority (64.78%) had normal/minor malocclusion. Among females, majority (78.90% : 187) had normal/minor malocclusion. The distribution of severe malocclusion and handicapping malocclusion was statistically highly significant (p ≤ 0.001) among males compared to females.

[Table/Fig-4] shows age and gender-wise distribution of children in relation to mean Dental self confidence scores. On the whole, the mean Dental self confidence score differed significantly among both male (p ≤ 0.001) and female children (p ≤ 0.001) across the age groups.

[Table/Fig-5] shows age and gender-wise distribution of children in relation to mean Social impact mean scores. Overall, the mean Social impact score did not differ significantly among both male (p ≤ 0.31) and female children (p ≤ 0.12) across the age groups.

DISCUSSION

Improvement of oral health and enhancement of psychosocial well-being are perceived benefits of orthodontic treatment. Patients' expectations from orthodontics are primarily improvements in appearance, self-image and social functioning.

Since consciousness of body image increases during childhood and adolescence, young adults are considered to be a relevant age group for the study of perception of personal dental appearance [6]. Hence, the age group of 12 to 15 yrs school children was selected for the study (mean age of the children was 13.56 ± 0.91 yrs).

DAI is considered to be a quick and useful index for identifying unmet orthodontic treatment needs. It demonstrates a high degree of validity and reliability. Mainly anterior traits of malocclusion were investigated in the present study since traits visible in normal face-to-face interaction represent the aesthetic aspect of the occlusion. Previous studies have shown that self-awareness and satisfaction are related mainly to visible features [6]. Hence, DAI was used in the present study to assess the malocclusion traits.

The mean DAI score of the children was 18.2 in the present study. A higher mean DAI scores were observed in the studies of Lew KK [7], Ansai et al., [8], Estioko et al., [9] of 22.3, 30.5 and 24.1 respectively. The variation of DAI scores may be related to different cross cultural differences, variations in growth, facial skeleton development, occlusion and genetic predisposition [10].

In the present study males had significantly higher mean DAI scores than females (p<0.001). Also significantly higher proportion of males had severe and handicapping malocclusion (p <0.001). This is similar with the results of Rashidah et al., [11]. However, studies by Ansai et al., [8], Lew KK [7] and Otuyemi et al., [12] found no difference in mean DAI scores among males and females. The higher mean DAI score among males in the study done by Rashidah et al., [11] was attributed to variation in dentofacial morphology among boys and girls.

In the present study, the mean DAI scores among 13 yrs and 14 yrs was significantly higher compared to that of 12 y and 15 y (p < 0.001). The findings are similar to the those of KM Shivakumar et al., [13].

Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) [4] derived from Oral Health Related Quality of Life (OHRQoL) is considered to be a valid psychometric instrument in measuring the orthodontic-related changes in patient's well being. The PIDAQ includes four factors: Dental Self-Confidence; Social Impact; Psychological Impact and Aesthetic Concern. In this study the first two factors were taken into consideration.

The first factor, 'Dental Self-Confidence', assessed the significant impact of dental aesthetics on the emotional state of an individual. Huppert and Whittington suggested that positive and negative well-being relate differently to psychological and social conditions. It therefore appears necessary to measure positive impacts of dental aesthetics on the emotional state of a person. Aspects of dental aesthetics studied were missing teeth, crowding, spacing and open bite in the anterior segment (upto the first premolar) for both maxillary and mandibular teeth [14].

The present study revealed that as the Dental Aesthetic Index score increased the Dental Self-Confidence scores decreased. The mean Dental self confidence score was maximum (15.43 ± 4.27) for children with Normal/Minor malocclusion and minimum (13.75 ± 4.80) for the Handicapping malocclusion. The scores differed significantly (p<0.023) in different categories of malocclusion. This is in agreement with the study done by Ulrich Klages [4] and Vanishree MK et al., [15] who inferred that dental aesthetics had a significant impact on Dental self-confidence.

The second factor, which was termed 'Social Impact', includes items referring to potential problems in social situations due to subjective perception of an unfavourable dental appearance. Malocclusion might be perceived as unfavourable personality trait by others Kerosuo et al., and this may disturb the self-concept and self efficacy of the affected individuals Albino et al., [4].

In the present study, the mean Social impact score was maximum (9.61± 7.38) for the Handicapping malocclusion and minimum (9.22 ± 5.79) for the Definite malocclusion. This is in agreement with the study done by Ulrich klages [4] and Vanishree MK et al., [15]. In contrast to the present study, the effect of dental aesthetics on social impact was statistically significant in these studies.

The results of the present study have shown that subjects with lower DAI scores had less of aesthetic concern, i.e. less disapproval of one's own dental appearance and subjects with more DAI scores had more aesthetic concern i.e. more disapproval on one's own dental appearance. This was in agreement with the study done by Ulrich Klages [4] and Vanishree MK et al., [15].

Of primary importance in determining individual therapeutic measures is self-perception of dental appearance [16]. Self-perception is influenced by the social aesthetic norms but is also related to psychologic factors and personal norms for dental attractiveness. In this study the social desirability bias may be considered to have influenced the responses of the children and can be considered a limitation of the study.

CONCLUSION

The results of the present study imply that dental aesthetics have a significant impact on the psychosocial aspects of human life irrespective of the gender. However, studies using photographs and models should be conducted. Further case-control and longitudinal studies with a larger sample size comparing the treated and untreated malocclusion groups is suggested to better understand the psychosocial impact of dental aesthetics.

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