

Social judgments made by children (10–15 year old) in relation to visible incisors trauma: School-based cross-sectional study in Khartoum state, Sudan

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Abstract

Background: Dento-alveolar trauma is a very common occurrence in childhood; however, there is a paucity of data about children's judgments in relation to dental status. There is a significant correlation between the children's incisor teeth status and the social judgments made by their peers. **Aim:** The purpose of this study was to determine whether the social attributes of a school child would be influenced by his or her incisor teeth status. Also, it is aimed to determine the judgment between male and female children and different age groups within the same class. **Setting and Design:** A descriptive cross-sectional study conducted among 178 male and female children from year 5 (age 10–11 years) of primary school and year 2 of secondary school (age 14–15 years) within Khartoum state. **Materials and Methods:** Students were invited to look at colored photographs of four different children's faces and to make a social judgment about these children's photographs. Using a previously validated child-centered questionnaire, participants rated subjects using a four-point Likert scale for three negative and six positive attributes. **Statistical Analysis:** Total attribute scores were tested for significant differences, according to whether the subject had visible incisor trauma or not, using *t*-test and analysis of variance (ANOVA) test with the level of significance set at $P \leq 0.05$. **Results:** Children with visible incisor trauma were given more negative attributes than children without incisor trauma ($P = 0.05$). Results were similar in both genders and both school years. Younger students within the same class gave more negative attributes toward children with visible incisor trauma than their older peers, with $P = 0.04$ and $P = 0.9$ for children aged 10 years and 11 years, respectively. **Conclusion:** The data confirmed results of previous studies that children with visible incisor trauma are seen more negatively than those without visible incisor trauma.

Key words: Children, dental appearance, incisor trauma, self-esteem, social judgments

INTRODUCTION

Social judgment is how we perceive people, form impressions about them, and think about social matters. Social psychology is concerned with how we make these judgments, how accurate they are, and

their consequences. Accepted facial appearance by the society plays an important role in the development of an individual's self-concept and self-esteem.^[1,2] Self-esteem is the sum of our attitudes, behaviors, and beliefs about how our body looks. What are the perceptions of others toward us? Improving a physical trait improves attitude,

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personality, and self-esteem. In short, self-esteem can be defined in terms of cognitive generalizations derived from past experiences.^[3] Keeping a good psychological health is not possible unless the essential core of the person is fundamentally accepted, loved, and respected by others and by his/her self. Social impact among school children toward each other may vary according to the visible perfection or abnormality related to an individual's dental status. A wide spectrum of inherited and acquired conditions affect the human dentition; discoloration made by dental trauma or fluorosis can negatively affect social judgment made by children and adolescents.^[4] The judgment process and the comparisons involved in it mediate attitude change, although the causal nature of the judgment process on attitude change is harder to determine.^[5] Facial attractiveness has been studied widely and girls as young as 9 years of age discern facial attractiveness in the same way as their mothers, although not necessarily to such a "sophisticated" level.^[6] Along with facial attractiveness, teenagers are also concerned with their body image, and those with good body satisfaction are commonly thought to be more popular.^[7] A wealth of evidence indicates that we are judged by others on the basis of our appearance, including dento-facial esthetics. Indeed, a dental appearance that deviates from acceptable norms may even negatively affect an individual's employment prospects.^[8,9] When anterior teeth are affected, not only the individual may be self-conscious of his/her dental appearance but also visible differences may be more readily seen by others during everyday social interactions. Dento-alveolar trauma is a very common occurrence in childhood and frequently results in compromised incisor esthetics. Crown fractures are by far the most common injury seen in children.^[10]

It is evident that a number of personality traits are attributed on the basis of dental appearance, particularly among adults. However, there is a paucity of data about children's judgments in relation to dental status. This is surprising as there is a background of high reported levels of distress from appearance-related teasing or bullying in adolescents.^[11] There is no previous study done in Sudan for tackling this issue.

The general objective of this study is to determine the social judgments made by school children in relation to visible incisor trauma in a primary and secondary school in Khartoum state, Sudan, while the specific objectives are to determine the judgment between male and female children and different age groups within the same class.

MATERIALS AND METHODS

Study design, area, and population

This was a descriptive, cross-sectional, school-based study. It was conducted at the Institution of Khartoum for Special Education (Al-Qabas school; primary and secondary) from November 2010 to February 2011. The participants were male and female students in year five of primary school (aged 10–11 years) and year two of secondary school (aged 14–15 years), excluding students with visible incisor trauma, a clear facial deformity, or disability, and those aged below 10 years and above 15 years.

Sample size and technique

The sample size was determined using the following equation after obtaining the total number of students in year 5 of primary school and year 2 of secondary school in Al-Qabas school, Khartoum state:

$$(n = z^2pq/d^2)$$

Where n = sample size; Z = critical value of significant level = 1.96; d = random error; $q = 1 - \text{prevalence} = 0.5$, and P = prevalence. The resulted sample size was 178. Students of each class were listed according to their roll numbers and they were then selected using systematic random sampling, while the first one was selected by simple random sampling.

Data collection tools

Standard, full-face, color photographs were taken of two boys and two girls (unknown to participants). They were happy and accepted voluntarily to be part of the study, and their parents also agreed and gave informed consent for their participation. They were aged between 10 and 15 years, and had either an intact incisor that had been digitally manipulated to show a variety of incisor trauma or a previously damaged incisor that had been also digitally manipulated to restore incisor esthetics. These photos had been digitally manipulated to prevent the effect of the confounding factors such as hairstyle or smile on the overall appearance [Figure 1].

Pictures were labeled with numbers to ease the statistical analysis of the data as follows: Picture (1) shows a male child with misaligned incisors; Picture (3) shows a photo of a female with a broken incisor; Picture (5) shows a photo of a male with missing incisors; Picture (7) shows a photo with a discolored incisor. Pictures with numbers (2), (4), (6), and (8)



Figure 1: Picture (1): male child with misaligned incisors; picture (3): female child with a fractured incisor; picture (5): male child with missing incisors; picture (7): female child with a discolored incisor; pictures with numbers (2), (4), (6), and (8) show an intact copy of the same children’s incisors, respectively

show an intact status of the same children’s incisors [Figure 1].

Ethical considerations

Ethical clearance and approval for conducting this research had been obtained from the ethical committee of the University of Medical Sciences and Technology. Informed and written consent had been taken from each individual and their parents before being enrolled in the study. Permission was taken from the Ministry of Education in Khartoum state, and a welcoming acceptance was given by the school administrator. The participants were not told that the study is dentally related. A lecture was given after data collection to educate the students and teachers about dental trauma. The lecture was given by the senior investigator who is specialized in endodontics and dental traumatology. Students with history of trauma or with an obvious sign of trauma were given advice and an option to be treated by the investigators for free.

Measures

The participants had been invited to look at those printed photos and make a social judgment based on the questions in the questionnaire. They had to attribute various socially relevant characteristics to these images. The questionnaire used was a previously validated, child-centered questionnaire.^[12] It included nine

descriptors for six positive and three negative attributes within three different domains: Social competence, psychological adjustment, and intellectual competence. We got the help of two bilingual experts who are fluent in both English and Arabic. The questionnaire was pretested in the Arabic language on 25 randomly selected school children of age between 10 and 15 years to ensure comprehensibility, validity, reliability, relevance, and accuracy in the context of Sudan. Cronbach’s alpha test showed a reliability coefficient of 0.85 and was found satisfactory for conducting the study. The piloted questionnaires were not included in the final study.

The participating children were asked questions according to the photo they were shown: Do you think this boy/girl is clever/kind/honest/confident/careful/helpful/rude/stupid/naughty? They rated the photos using a four-point Likert scale to record responses, ranging from “strongly agree,” “agree,” and “disagree” to “strongly disagree.” In the data analysis, the principal outcome measures were the total attribute scores, which were calculated by summing up the response codes. Attributions of negative and positive characteristics were assessed. The positive attributes, namely “clever,” “kind,” “honest,” “confident,” “careful,” and “helpful,” were scored as: Strongly agree = 4, agree = 3, disagree = 2, and strongly disagree = 1. While in the negative attributes – “rude,” “stupid,” and

“naughty,” – the scoring was reverse. Thus, a high score (maximum of 36) would correlate with a positively judged subject and a low score (minimum of 9) would correlate with a negatively viewed subject.

Data analysis

Data had been cleaned, organized, and entered in a master sheet on a personal computer and analyzed using the Statistical Package for Social Sciences (SPSS, version 17; SPSS Inc., Chicago, IL, USA). The descriptive statistics portion of the data was presented in the form of tables and figures using the Microsoft Excel program. Correlation and comparison between variables was done using the *t*-test as well as analysis of variance (ANOVA), with the level of statistical significance set at $P \leq 0.05$.

RESULTS

A total of 178 students (50% male and 50% female) from year 5 and year 10 (second year secondary school) completed the questionnaires. The mean age of the participants was 12.5 years, falling within the range of 10-15 years. The percentage and the number of participants according to their age are given in Table 1.

According to the school year, 43.3% of the participants were from year 5 (77 students) of primary school and 56.7% (101 students) were from year 2 of secondary school. Half [50% (89)] of the questionnaires given were pictures of children with visible incisor trauma and the other half were pictures of the same children with intact incisors. The mean scores (MS) for children with and without visible incisor trauma (36 = most positive score possible; 9 = most negative score possible) were obtained and the *t*-test was used for comparison between the mean scores with and without incisor trauma for each subject; the results are displayed in Table 2. Mean attribute scores (MAS) for children with and without incisor trauma according to the age of the students (36 = most positive score possible; 9 = most negative score possible) were also obtained as shown in Figure 2. The total MAS according to year

5 of primary and year 2 of secondary school students for subjects with visible incisor trauma and without visible incisor trauma were 23.15 and 25.22, and 23.55 and 24.65, respectively. ANOVA test revealed statistically insignificant relationship with *P* value of 0.17 [Figure 3].

The total MAS according to the sex of the students were calculated and the ANOVA test was used for testing the significance difference. The MAS for male students given pictures with visible incisor trauma and without visible incisor trauma were 23.27 and 24.25, respectively, with a *P* value of 0.3, while the female students gave MAS values of 23.48 and 25.51, respectively, with an insignificant *P* value of 0.09 [Table 3].

DISCUSSION

It is important to outline the possible limitations before interpreting the findings of the present study. Firstly, as a descriptive cross-sectional study, it is observational in nature: It provides a “snapshot” of a group of participants at one point in time. The analysis is usually restricted to the available information and is vulnerable to biases of interpretation. Secondly, our study was based on completion of a self-administered questionnaire by 10–15 year old children; the response may be subjectively affected by the age of the participants, especially those of 10 years of age. Thirdly, the study was limited to one area and one school of a large state, Khartoum. It may be biased as this area of the capital is of high socioeconomic status. Although it has been justified below, still it limits the generalization of the results. Fourthly, based on the selected school, the sample size is representative, but the sample size was not equally distributed among all age groups. This may have resulted in inconsistency of the results. When it showed insignificance between

Table 1: Distribution of the questionnaires given to the students according to their age (N=178)

Age, years	Frequency	Percent
10	53	29.8
11	24	13.5
14	15	8.4
15	86	48.3
Total	178	100.0

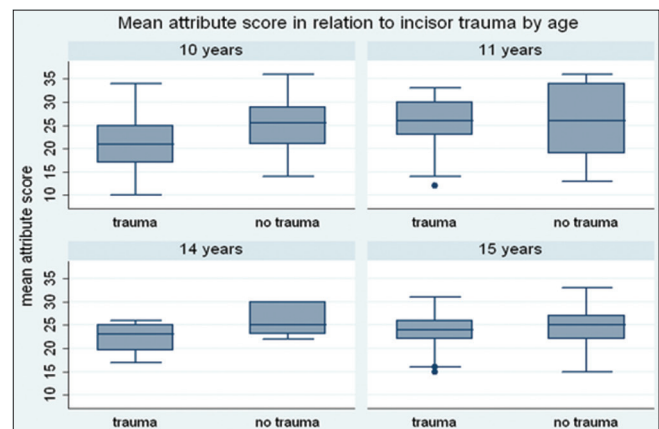


Figure 2: Mean attribute scores for children with or without visible incisor trauma according to their age

Table 2: Mean (SD) of attribution scores for children with and without visible incisor trauma (36=most positive score possible; 9=most negative score possible)

Status of the incisor teeth	Mean	SD	95% Confidence interval		Min.	Max.	P
			for mean				
			Lower bound	Upper bound			
Subject 1 (male)*							
With incisor trauma	22.45	4.8	20.3	24.6	12	31	0.3
Without incisor trauma	23.77	3.8	22.1	25.5	18	32	
Subject 2 (female)**							
With incisor trauma	24.59	4.5	22.6	26.6	14	33	0.2
Without incisor trauma	26.74	5.6	24.3	29.2	15	36	
Subject 3 (male)***							
With incisor trauma	20.96	4.9	18.9	23.1	10	33	0.8
Without incisor trauma	21.41	4.7	19.3	23.5	13	29	
Subject 4 (female)****							
With incisor trauma	25.59	5.7	23.1	28.1	12	34	0.2
Without incisor trauma	27.55	4.6	25.5	29.6	18	36	

*Child with misaligned incisors, **child with a fractured incisor, ***child with missing incisors, ****child with a discolored incisor

Table 3: Mean (SD) attribution scores for children with and without visible incisor trauma according to the gender of the participant

Status of the incisor teeth	Male		Female	
	Mean	SD	Mean	SD
Subject 1 (male)*				
With incisor trauma	23.55	4.63	21.36	4.90
Without incisor trauma	23.55	4.27	24.00	3.46
P value	1		0.1	
Subject 2 (female)**				
With incisor trauma	23.45	4.61	25.73	4.38
Without incisor trauma	25.42	5.23	28.18	5.83
P value	0.40		0.30	
Subject 3 (male)***				
With incisor trauma	22.42	2.50	19.36	6.31
Without incisor trauma	20.60	5.54	22.08	4.06
P value	0.30		0.20	
Subject 4 (female)****				
With incisor trauma	23.73	6.20	27.45	4.59
Without incisor trauma	27	4.20	28.09	5.07
P value	0.1		0.8	
Presence of visible incisor trauma	23.27	4.50	23.48	5.92
Absence of visible incisor trauma	24.25	5.23	25.51	5.26
P value	0.3		0.09	

*Child with misaligned incisors, **child with a fractured incisor, ***child with missing incisors, ****child with a discolored incisor

primary and secondary groups, statistically significant difference was found when different ages within the same class were considered, in spite of the fact that the sample was randomly selected from the Institution of Khartoum for Special Education (Al-Qabas school) through a statistically designed method. The city of Khartoum is the capital of Sudan and is similar to some other capitals in the world where people have migrated or displaced from different parts of the country to live in.

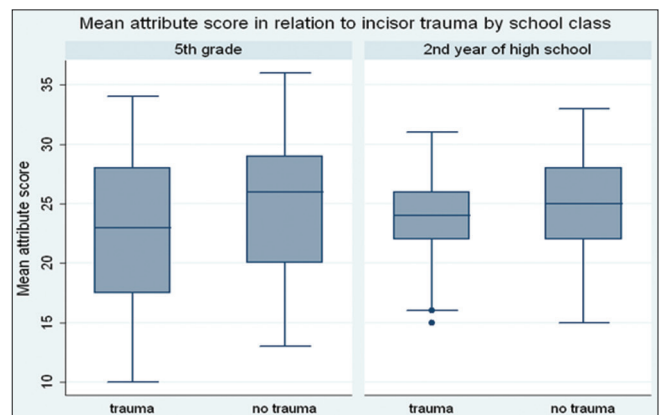


Figure 3: Mean attribute scores for children with or without visible incisor trauma according to the class of the students

Therefore, it can be assumed that Khartoum is relatively representative of Sudan in its entirety. The Institution of Khartoum for Special Education is the owner of Al-Qabas schools, which has different schooling systems (Curriculum National Sudanese, Curriculum National Sudanese Translator into English, Curriculum Foreign English) with all levels (kindergarten–primary–secondary), and it comprises of children with different financial and social statuses. So, these schools with some caution can represent the students from the Khartoum state.

There was a significant correlation between the children’s incisor teeth status and the social judgments made by their peers according to the given photographs. This result agrees with the previous studies.^[9,13-17]

When reviewing and comparing the attributes given by children in year 5 of primary school with those given

by children in year 2 of secondary school, it revealed that there was no difference between younger and older students in their negative or positive attributes toward the given questionnaires. A surprising finding was the marked difference in peer evaluation according to age within the same school year; younger students within the same class gave more negative attributes toward subjects with visible incisor trauma than their older peers. There may be a number of reasons for this finding; older children may have more likely experienced dental trauma and know its consequences in terms of social judgments than younger students in the same class. Also, older students might have previously held negative thoughts about the subject, but modified their responses to what they considered to be more socially acceptable.^[12] It is well recognized that adolescents demonstrate the highest degree of self-monitoring compared to any other age group, with self-monitoring behavior increasing from early to late adolescence.^[13] Every effort should be made to prevent or minimize damage to children's teeth which in turn affects their esthetics and social evaluations by their peers. Researches show exercise may be an important measure in improving children's self-esteem.^[18] Children should be educated from an early age about the psychological impact affecting their colleagues who are suffering from an abnormality in their appearance, especially related to the front teeth.

When comparing between males and females, our result agreed with Tobiasen's study result that neither age nor gender of the subject was significantly related to judgments of facial deformity.^[19] They both gave more negative attributes toward children with visible incisor trauma than those without incisor trauma. This indicates that gender plays a negligible role in influencing the children's evaluations.

CONCLUSION

Children with visible incisor trauma are seen more negatively than those with no visible incisor trauma, with a *P* value of 0.05. The age of the students plays an insignificant role in influencing of their judgments. School year does not affect students' judgments toward other children with or without incisor trauma. The gender of the student has no effect in evaluating and judging other children based on their dento-facial appearance. Dental treatment for children with incisor trauma that resulted in abnormal appearance may yield important psychosocial benefits.

It is recommended to conduct further studies including a larger sample representing the entire

school community and that school teachers should be evaluated regarding their attitude and knowledge toward dental trauma and how to manage it.

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Conflicts of interest

There are no conflicts of interest.

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