Impact of Oral Conditions on the Quality of Life of Secondary Schoolchildren in Nigeria

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ABSTRACT

Purpose: Oral health problems have been increasingly recognized as important factors causing a negative impact on daily performance and quality of life. The purpose of this study was to assess the impact of tooth extraction with no replacement, untreated fractured anterior teeth, malocclusion, dental restorations, and orthodontic braces on the quality of life in Nigerian schoolchildren.

Methods: A total of 197 9- to 17-year-old schoolchildren completed the Oral Health Impact Profile (OHIP) index/questionnaire.

Results: Students who had tooth extraction with no replacement and untreated fractured incisors had significantly higher mean OHIP scores for functional limitations, physical pain, psychological discomfort, physical, psychological, and social disabilities, and handicaps ($P<.001$) when compared to other groups and the control. The mean OHIP scores of students with features of malocclusion were significantly higher for functional limitations, psychological discomfort, and psychological disability compared to the control group ($P<.001$).

Conclusions: Untreated dental problems had some negative impact on the quality of life on the 7 subscales of the OHIP. (J Dent Child 2012;79(3):159-64)

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KEYWORDS: TOOTH, EXTRACTION, FRACTURE, CHILDREN, QUALITY OF LIFE

The World Health Organization (**WHO**) defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."[1] The definition of health is complex, and concepts such as those proposed by the WHO may not be able to capture the full meaning of "health." The present concept of health requires the inclusion of psychosocial aspects, such as issues related to quality of life (**QOL**), which is closely associated with human relationships in contemporary society.[2] Therefore, disruptions in normal physical, psychological, and social functioning are important considerations in assessing oral health.[3]

Oral health problems have been increasingly recognized as important factors causing a negative impact on daily performance and QOL. It has been shown that dental caries, trauma, and periodontal diseases can cause pain, infections, discomfort, poor esthetics, poor mastication, sleep disruption, high treatment costs, higher risk of hospitalization, and loss of school days, leading to a diminished ability to learn.[4]

Few studies have been conducted to verify the impact of different dental problems on self-perception and QOL in children and adolescents, considering their relationship with lifestyle and social environment.[5] Cortes et al.,[6] showed that children with fractured teeth experienced more negative impacts on their daily living than children without traumatic dental injury. Similarly, a case report showed severe emotional complications associated with fractured anterior teeth in children, sufficient to cause disturbances of mental attitude.[7] Dentofacial esthetics and self-perceptions of occlusal appearance as well as attitudes toward malocclusion and orthodontic treatment have an important impact on QOL, thereby motivating many to seek orthodontic treatment.[6]

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The purpose of this study was to measure the psychosocial impacts of anterior tooth extraction without prosthodontic replacement, untreated fractured teeth, malocclusion, dental restorations, and orthodontic braces in Nigerian schoolchildren.

METHODS

This cross-sectional study enrolled 9- to 17-year-old children of both sexes from 2 public and 2 private schools in Ilé-Ifẹ̀, Nigeria. They were randomly selected from a list of all the government-approved secondary schools to ensure an even socioeconomic distribution of the students. The first two public and private secondary schools on the list of schools in Ife central local government area of Osun state, Nigeria, were selected. A class of junior secondary school was purposely selected from each school.

The study was approved by the appropriate school authorities and the Ethics Committee of the Obafemi Awolowo University Teaching Hospitals, Complex in Ilé-Ifẹ̀, the major hospital that serves the community.

The Oral Health Impact Profile (**OHIP**) index, a 49-item questionnaire, was administered to each student to measure the impact of the oral conditions on QOL. The OHIP measures 7 conceptual dimensions of impact: (1) functional limitation (eg, difficulty with chewing); (2) physical pain (eg, sensitivity of teeth); (3) psychological discomfort (eg, self-consciousness); (4) physical disability (eg, changes to diet); (5) psychological disability (eg, reduced ability to concentrate); (6) social disability (eg, avoiding social interaction); and (7) handicaps (eg, being unable to work productively). This model is based on the WHO's international classification of impairments, disabilities and handicaps,[8] in which impacts of disease are categorized in a hierarchy ranging from internal symptoms, apparently primarily to the individual (represented in the dimension of functional limitation), to handicaps that affect social roles, such as work/play.

Each questionnaire item was rated on a 5-point Likert scale as such: 0—never or not applicable; 1—hardly ever; 2—occasionally; 3—fairly often; and 4—very often. The coded responses were multiplied by the corresponding weight for each question, and products were summed within each dimension to give 7 subscale scores, each with a potential range from 0 (no impact) to 40 (all impact reported).[8]

Dental examinations were carried out on all students by one of the authors (EOO) using dental mirror and explorer in a well lit room in the school. The intra examiner reliability was 97%. Based on the findings, the students were distributed into 6 groups: (1) those with anterior tooth extraction without replacement (tooth loss of more than a month); (2) untreated fractured anterior teeth; (3) presence of malocclusion; (4) presence of dental restorations; (5) presence of orthodontic braces; and (6) the control group. Students with more than one oral condition were excluded from the study. The control group consisted of students from the same schools who never had or required extractions, restorations, or orthodontic treatment and in whom there were no diagnostic features of malocclusion, caries, or fractured anterior teeth.

Data was analyzed using SPSS 16 software (SPSS Inc., Chicago, Ill., USA). The means of the scores were calculated for each subscale. Student's *t* test was used to determine the differences between the means. Statistical significance was inferred at $P<.05$.

RESULTS

A total of 197 9- to 17-year-old children participated in this study, including 97 males and 100 females with a mean age of 13 years old (±5 SD, Table 1). There were 130 schoolchildren in the subject group of which 64 were males while 66 were females. The control group consisted of 67 schoolchildren (33 males and 34 females).

There was no statistically significant difference in the mean scores of all the domains of OHIP between

Table 1. Age Group Distribution by Gender and School Type

School type	Age group	Subjects						Controls					
		Sex						Sex					
		Male		Female		Total		Male		Female		Total	
		No	%	No	%	No	%	No	%	No	%	No	%
Private	9-11	7	8.97	14	17.95	21	26.92	7	21.21	5	15.15	12	36.36
	12-14	23	29.49	23	29.49	46	58.98	4	12.12	11	33.33	15	45.45
	15-17	8	14.10	3	3.85	11	14.10	2	6.06	4	12.12	6	18.18
	Total	**38**	**48.72**	**40**	**51.28**	**78**	**100.00**	**13**	**39.39**	**20**	**60.61**	**33**	**100.00**
Public	9-11	0	0.00	1	1.92	1	1.92	1	2.94	0	0.00	1	2.94
	12-14	12	23.08	10	19.23	22	42.31	0	0.00	0	0.00	0	0.00
	15-17	14	26.92	15	28.85	29	55.77	19	55.88	14	41.18	33	97.06
	Total	**26**	**50.00**	**26**	**50.00**	**52**	**100.00**	**20**	**58.82**	**14**	**41.18**	**34**	**100.00**

the schoolchildren of both public and private schools in the control and the subject groups (Tables 2 and 3).

FUNCTIONAL LIMITATIONS

The mean OHIP score for functional limitations was highest for students who had extractions without replacement (15.26), followed by students with untreated fractured anterior teeth (15.22); in the control group, the mean OHIP score was 9.40. The mean score of functional limitation in all the groups were significantly higher than that of the control with the exception of those wearing braces. A statistically significant difference was also observed between all the groups, with the exception of those with dental restorations and those with malocclusions (Table 4).

PHYSICAL PAIN

The mean OHIP score for physical pain was highest in students who had extractions without replacement (21.13), followed by students who had untreated fractured anterior teeth (18.61); the lowest score was observed in students with diagnostic features of malocclusion (13.37). However, the mean score of physical pain in the groups with "extractions without replacement" and "untreated fractured anterior teeth" were found to be significantly higher than the control group. Moreover, statistically significant differences were observed between the group "extraction without replacement" and all the other groups. Similarly, statistically significant differences were noted between the group "untreated anterior fractured teeth" and all the other groups (Table 4).

PSYCHOLOGICAL DISCOMFORT

Students who had extraction without replacement had the highest mean score for psychological discomfort (16.71), followed by those with untreated fractured anterior teeth (16.65); the lowest mean score was seen in the control group (9.24). The mean score of psychological discomfort in all the groups were significantly higher than that of the control. There were significant differences in the mean scores of all the groups except between "extractions without replacement" and "untreated fractured anterior teeth" (Table 4).

PHYSICAL DISABILITY

For physical disability, students with untreated fractured anterior teeth had the highest mean OHIP score (14.20), followed by students who had extraction without replacement (13.31); the lowest mean score for this dimension was seen in students with diagnostic features of malocclusion (6.41). The mean score of physical disability in all the groups were significantly higher than that of the control with the exception of those having dental restorations. Also significant differences were noted between all the groups with the exception of "extraction without replacement" and "untreated fractured anterior teeth"(Table 4).

PSYCHOLOGICAL DISABILITY

The mean OHIP score for psychological disability was highest for students who had extractions without replacement (15.26), followed by students with untreated fractured anterior teeth (15.08); the lowest mean score for this dimension was found in the control group (7.68). The mean OHIP scores of "extractions without replacement," "dental restorations" and "untreated fractured anterior teeth" were statistically significantly higher than the control. However, there were no statistically significant differences between "extraction without replacement" and "untreated fractured anterior teeth" as well as between "presence of malocclusion" and presence of braces" (Table 4).

SOCIAL DISABILITY

The mean OHIP score for social disability was highest for students with untreated fractured anterior teeth (8.35), followed by students who had extraction without

Table 2. Mean Oral Health Impact Profile Scores For the Control Group by School Type

Domain	School type	N	Mean	Std. Deviation	*t*	*P*
Functional Limitation	Private	32	10.0922	7.21669	0.648	0.519
	Public	31	9.0108	5.94836		
Physical pain	Private	32	14.6345	8.72870	0.377	0.707
	Public	33	13.8636	7.72077		
Psychological discomfort	Private	33	8.2335	8.48539	-0.978	0.332
	Public	33	10.4140	9.59354		
Physical disability	Private	31	9.2372	7.03481	0.738	0.463
	Public	33	7.8922	7.51180		
Psychological disability	Private	33	8.4703	8.52161	0.703	0.484
	Public	33	6.9988	8.47575		
Social disability	Private	33	5.6942	8.09326	-0.057	0.955
	Public	33	5.8107	8.60397		
Handicapped	Private	33	4.5608	6.05537	0.153	0.879
	Public	34	4.3330	6.13017		

Table 3. Mean Oral Health Impact Profile Scores in the Study Group by School Type

Domain	School type	N	Mean	Std. Deviation	*t*	*P*
Functional Limitation	Private	71	11.6404	7.39986	-0.971	0.333
	Public	51	13.0717	8.83279		
Physical pain	Private	73	14.6062	9.28056	-1.291	0.199
	Public	48	16.8605	9.57593		
Psychological discomfort	Private	74	13.0161	9.36065	-1.747	0.083
	Public	51	16.0706	9.95549		
Physical disability	Private	69	10.5727	7.96812	-0.168	0.867
	Public	50	10.8431	9.51437		
Psychological disability	Private	73	9.5538	9.45519	-1.478	0.142
	Public	47	12.3231	10.83543		
Social disability	Private	74	5.5692	8.17059	-0.510	0.611
	Public	48	6.3832	9.27069		
Handicapped	Private	77	4.9930	7.52164	-1.439	0.153
	Public	50	7.1301	9.10106		

replacement (8.31). The lowest mean OHIP score for this dimension was 3.93 in students who had fillings on the teeth. The mean score of social disability in all the groups were significantly higher than that of the control with the exception of those wearing braces. The mean score in this domain was not statistically significantly higher between the group "untreated fractured anterior teeth" and "extraction without replacement." Similarly, there was no significant difference between the group "presence of malocclusion" and "dental restorations" (Table 4).

HANDICAPS

The highest mean OHIP score for handicaps was for students who had extraction without replacement (11.45), followed by those who had untreated fractured anterior teeth (9.28); the lowest mean score for this dimension was seen in students with diagnostic features of malocclusion (3.28). The mean score of handicaps was statistically significantly higher in all the sub groups within the study group than in the control group. Similarly, there were statistically significant differences between all the groups (Table 4).

Of the 7 conceptual dimensions measured, physical pain had the highest mean OHIP score (21.13), while handicaps had the lowest score (3.28). The overall mean OHIP score was highest in students who had extractions without replacement (14.49), followed by those who had untreated fractured anterior teeth (13.91); the lowest mean score was seen in students with diagnostic features of malocclusion (3.28). The overall mean OHIP score in all the groups were significantly higher than that of the control with the exception of those diagnosed with malocclusion (Table 4).

DISCUSSION

Oral health problems have been shown to cause a negative impact on daily performance and QOL but few studies have been conducted to measure it and were done mostly in adult populations.[9-14] Little is known about that impact on children and adolescents.[15-18] This study tried to examine the impact of some oral conditions in schoolchildren as well as the effect of some dental treatments on their QOL.

Students who had extractions without replacement and those with untreated fractured anterior teeth had the highest impact scores among all 7 dimensions of the QOL measured ($P<0.05$) when compared to other groups and the control. Compared to other students, these students were more likely to report an impact for chewing, sensitivity, self consciousness, changes in diet, reduced ability to concentrate, and avoiding social interaction. In a similar study involving Spanish school children using the same questionnaire, the highest impact score (13.5) was also recorded for those with missing anterior tooth.[19] Cortes[6] showed that school children with untreated fractured anterior teeth experienced a higher sociodental impact on their daily living than children with no traumatic dental injury.

Physical pain (toothache, sensitivity, painful gingiva) had the highest impact score out of the 7 dimensions examined in all the different groups. This study may not be able to adduce any reason for this, but it may be argued that pain and sensitivity from untreated dental

Table 4. Mean Oral Health Impact Profile Scores of the Study Group

	Study Group (N=197)					
Variables	Extractions without replacement (N=12)	Dental restorations (N=18)	Untreated fractured anterior teeth (N=33)	Presence of malocclusion (N=42)	Presence of braces (N=25)	Control (N=67)
	Mean±(SD)	Mean±(SD)	Mean±(SD)	Mean±(SD)	Mean±(SD)	Mean±(SD)
Functional limitations	15.26±1.55[a]	10.57±1.22[b]	15.22±1.62[c]	10.95±1.25[d]	9.86±1.01[e]	9.40±1.25[f]
Physical pain	21.13±1.67[a]	14.48±1.34[b]	18.61±1.62[c]	13.37±1.34[d]	13.94±1.31[e]	14.04±1.38[f]
Psychological discomfort	16.71±1.51[a]	14.96±1.31[b]	16.65±1.60[c]	11.62±1.39[d]	13.00±1.37[e]	9.24±1.33[f]
Physical disability	13.31±1.59[a]	9.49±1.31[b]	14.20±1.59[c]	6.41±1.10[d]	12.10±1.24[e]	8.60±1.28[f]
Psychological disability	15.26±1.31[a]	10.49±1.35[b]	15.08±1.52[c]	7.80±1.18[d]	8.42±1.08[e]	7.68±1.17[f]
Social disability	8.31±1.31[a]	3.93±0.75[b]	8.35±1.36[c]	4.40±0.93[d]	5.66±0.99[e]	5.74±1.06[f]
Handicap	11.45±1.44[a]	5.31±0.80[b]	9.28±1.38[c]	3.28±0.84[d]	3.53±0.73[e]	4.45±0.95[f]
Overall mean	14.49±1.48[a]	9.89±1.54[b]	13.91±1.53[c]	8.26±1.15[d]	9.50±1.10[e]	8.45±1.20[f]

Games Howell multiple comparison of Means (P<0.05)

Functional Limitation: ab, ad, ae, af, bc, bf, cd, ce, cf, de, df P<0.05

Physical Pain: ab, ac, ad, ae, af, bc, cd,c e, cf

Psychological discomfort: ab, ad, ae, af, bc, bd, be, bf, cd, ce, cf, de, df, ef

Physical disability: ab, ad, af, bc, bd, be, cd, ce, cf, de, df, ef

Psychological disability: ab, ad, ae, af, bc, bd, be, bf, cd, ce, cf

Social disability: ab, ad, ae, af, bc, be, bf, cd, ce, cf, de, df

Handicap: ab, ac, ad, ae, af, bc, bd, be, bf, cd, ce, cf, de, df, ef

Over all OHIP : ab, ad, ae, af, bc, bd, bf, cd, ce, cf, de, ef

Note: a, b, c, d, e, f, represent each column for easy reporting of comparisons of means

caries could be the cause. Akpata[20] showed that the restorative treatment needs of Nigerians are high. Another reason may be pubertal gingivitis, which can be painful, making tooth-brushing and eating uncomfortable.

This study noted that the impact of psychological discomfort and social disability was high for children who had extractions without replacement and those with untreated fractured anterior teeth when compared to other groups and the control ($P<0.05$). These students are self-conscious about their appearance and they may be teased and bullied by siblings and peers. This, in turn, may affect both their school performance and their ability to socialize. Our findings on social disability were different from those of Gherunpong et al.[3] Schor[21] suggested that children's social performances rely more on their physical and psychological performances than those of adults.

It may be difficult to describe the esthetic values of Nigerian children due to modernization, which has greatly influenced the society. Fractured anterior teeth and anterior tooth loss, however, may constitute a greater hindrance to social interaction than malocclusion, as shown by this study. Interestingly, children with malocclusion had a low impact of psychological discomfort compared to those wearing braces. It is reasonable to conclude that those who are not aware of their need for orthodontic intervention may not be bothered, unlike those wearing braces. Anosike et al.,[22] showed that most Nigerian schoolchildren were found to have a dental appearance that needed orthodontic treatment; however, components of the oral conditions impacted the QOL of only a few subjects.

Students wearing braces had low mean OHIP scores for social disability and handicaps compared with other groups ($P<0.05$) and the control. The reason may be due to the fact that they were already undergoing treatment and because the wearing of braces is considered a sign of affluence in this environment. It is interesting to note that all children wearing braces attended private schools.

Students who had dental restorations reported a slightly high impact for chewing, sensitivity, self-consciousness, changes in diet, and reduced ability to concentrate, even though they had treatment. The reason for this may be that the fillings may not have been properly placed and also, wrong materials were used. Further studies exploring the reasons for the high impact are needed.

The impact of oral health on the QOL in children is particularly relevant. Their perceptions are important, as many of their social and psychological coping skills are still developing. Therefore, they are more sensitive to a variety of impacts, including appearance, on their health-related QOL.

CONCLUSIONS

Based on this study's results, the following conclusions can be made:

1. The mean OHIP scores of the study population were significantly higher ($P<0.05$) for students who had extractions without replacement and those with untreated fractured anterior teeth in all 7 subscales measured when compared to other groups and the control.
2. Students with malocclusion reported less impact in most of the subscales examined vs those wearing braces ($P<0.05$).

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