

# ORAL HEALTH STATUS OF MENTALLY AND PHYSICALLY CHALLENGED CHILDREN IN THE SEKONDI METROPOLITAN AREA OF GHANA

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## ABSTRACT

**INTRODUCTION:** Oral hygiene has been implicated as a causal factor in the development of dental caries and periodontal diseases, and this may be negatively affected by physical disability and the limited understanding in persons with intellectual needs. It was for this reason and the fact that no published study has been reported in this group in Ghana that the need for a study of the oral hygiene status of mentally and physically challenged children became imperative.

The main objective was to determine the oral hygiene status of physically and mentally challenged children aged 6-15 years in the Sekondi Metropolitan area of the Western Region in Ghana.

**MATERIALS AND METHODS:** A cross-sectional survey to determine the oral hygiene status of physically and mentally challenged children aged 6-15 years in the Sekondi Metropolitan area of the Western Region in Ghana.

**RESULTS:** The Oral Hygiene Index score (OHI-S) among 6 to 10-year-old mentally challenged school children was 2.67, and for the age groups 11-15, the score was 3.0. Among the physically challenged, the OHI-S for age group 6-10 was 0.46, and for the 11-15-years old, it was 0.99. These scores reflect that oral hygiene status was fair in the physically challenged but quite poor in the mentally challenged children of comparable age.

**KEY WORDS:** Oral Hygiene Index Score, Physically and Mentally Challenged, 6 to 15 year-olds.

## INTRODUCTION

Oral hygiene has been implicated as a causal factor in the development of dental caries and periodontal diseases in children and adolescents<sup>1,2</sup> and even more especially in mentally and physically challenged individuals<sup>3,4</sup>; poor oral health impacts negatively on the ability to chew and enjoy food, digestion and ultimately on nutrition; facial shape and speech<sup>5,6</sup>. Dental diseases are increasing in Ghana due to poor oral hygiene and lack of access (geographical and financial) to orthodox dental care<sup>7</sup>.

Urban children have greater access to dental care but also consume refined sugars at higher frequency<sup>8</sup>. Poor oral hygiene combined with the consumption of sugar will lead to poor oral health. Children from the same cultural background have little difference in dietary habits and general hygiene practices<sup>8</sup>.

Oral hygiene and, ultimately oral health may be negatively affected by physical disability and the limited understanding in persons with intellectual needs<sup>9</sup>; as these conditions present oral caregivers with difficulty in carrying out regular oral hygiene practices and transfer of information.

The oral hygiene status of mentally and physically challenged school children may reflect the level of care the community has provided or willing to provide for these groups of people.

There is very limited general information on oral hygiene status and practices among physically and mentally

challenged school children in resource-poor countries like Ghana. This study thus aims at contributing to closing this knowledge gap.

1. To determine the state of oral cleanliness of mentally and physically challenged school children aged 6-15 years in two selected special schools.
2. To assess the oral hygiene status of mentally and physically challenged children aged 6-15 years.

## MATERIALS AND METHODS

A cross-sectional descriptive survey was carried out on mentally and physically challenged pupils.

The study was carried out at the Sekondi Special School and Sekondi School for the Deaf and Dumb. The Green and Vermilion Debris Index and Calculus Index Scores were used to record the oral hygiene status of six(6) to fifteen (15) year olds, using their fully erupted permanent teeth

All the participants within the selected aged groups willing to participate and can comprehend the aims of the study were selected.

The ethical approval was obtained from the ethical review committee for research of Ghana Health Service. Consent was sought from the District Education Directorate and the parents of the children in the study. Children who refused to participate did not suffer any punitive consequences.

All courtesies accorded to the clinical patients were also extended to the non-participating children.

Oral examination was done using an explorer and mouth mirror under natural light. The examination was carried out after permission was obtained from the headteachers on behalf of the parents.

### Procedure for the estimation of oral hygiene status (OHI-S)

The procedure used was the Greene and Vermilion method<sup>10</sup>. This method has two (2) components (Tables 1A and 1B).

- The Debris Index (DI)-S. This was used for measuring the amount of plaque on the teeth surfaces.
- Calculus Index (CI)-S. This was used to measure the amount of calculus on the teeth surfaces

**Table 1A. Scoring for debris index**

Code	Interpretation
0	No soft debris/plaque on surface
1	Soft debris/plaque covering not more than 1/3 of tooth surface
2	Soft debris/plaque 1/3 but not more than 2/3 of exposed tooth surface
3	Soft debris/plaque covering more than 2/3 of exposed tooth surface

**Table 1B. Scoring for calculus index**

Code	Interpretation
0	No soft calculus on surface
1	gingival calculus covering not more than 1/3 of tooth surface
2	gingival calculus 1/3 but not more than 2/3 of exposed tooth surface
3	Soft calculus covering more than 2/3 of exposed tooth surface

The above scores may be analyzed separately or combined for the Oral Hygiene Index (OHI-S) scores; in this study, they were combined.

Each respondent was given a disclosing tablet to chew, mixing with saliva and swishing the mixture around the mouth for 30 seconds. They then spat it out for easy identification of plaque on the tooth surfaces.

The Green and Vermillion method uses six (6) index teeth with selected surfaces, as shown below. The six surfaces examined are selected from three upper (16, 11, 26) and three lower teeth (46, 31, 36), as shown in Table 2. The DI-S and CI-S values (calculated for the six(6) teeth as shown in Table 3) range from 0 to 3 and the total OHI-S values from 0 to 6. (Table 4 and 5)

**Table 2. Teeth and surfaces examined**

Tooth surface examined	Tooth number
Facial	11, 16, 26, and 31
Lingual	36, and 46

**Table 3. Calculation of (DS)-S and (CI)-S from total scores**

Debris Index score = $(\text{Total Debris Score})/6$
Calculus Index Score = $(\text{Total Calculus Score})/6$

**Table 4. Interpretation of calculated DI-S and CI-S values**

Interpretation	Value calculated
Excellent	0
Good	0.1 – 0.6
Fair	0.7 – 1.8
Poor	1.9 – 3.0

### Scores for Evaluation

The average individual debris and calculus scores were combined (DI-S + CI-S) to obtain the simplified Oral Hygiene Index (OHI-S). (Table 5)

**Table 5. Interpretation of simplified oral hygiene index (OHI-S)**

Interpretation	Combined DI-S and CI-S value
Excellent	0
Good	0.1 – 1.2
Fair	1.3 – 3.0
Poor	3.1 – 6.0

After the oral examination, respondents were asked to rinse their mouth and informed to go about their normal duties; It was explained to respondents that the stains on their teeth would disappear after brushing.

## RESULTS

One hundred participants were involved in the study, comprising 50 (29 males and 21 females) physically challenged students and 50 mentally challenged students (30 males and 20 females). Seventy – (71%) percent of participants were between the ages of 11-15, while 29% were 6-10 year-olds.

### Oral hygiene status

The mentally challenged children had a poorer oral hygiene status with a mean score of 5.67, comparable to the physically challenged children who had a mean score of 1.45.

**Table 1. Age and Sex distribution of respondents**

Respondents	Number of Males (%)	Number of Females (%)	Total Number
<i>Mentally challenged</i>			
6 – 10 yrs	6 (10.2%)	8 (19.5%)	14(29.7%)
11 – 15 yrs	24 (40.7%)	12 (24%)	36(29.3%)
<i>Physically challenged</i>			
6 – 10 yrs	9 (15.3%)	6 (14.6%)	15(29.9%)
11 – 15 yrs	20 (33.9%)	15 (36.5%)	35(70.4%)
Total Number	59	41	100

**Table 2. Debris index (DI), calculus index (CI), mean oral hygiene index (OHI) among the two groups**

Mentally Challenged					Physically Challenged				
Age Group	Number	DI-S	CI-S	OHI-S	Age Group	Number	DI-S	CI-S	OHI-S
6 – 10 yrs	14	1.02	1.65	2.67	6 – 10 yrs	15	0.18	0.28	0.46
11 – 15 yrs	36	1.88	1.12	3.00	11 – 15 yrs	35	0.50	0.49	0.99

## DISCUSSION

This study presented an overview of the oral hygiene status among physically and mentally challenged school children age 6-15 years in Sekondi special school and Sekondi school for the deaf in Sekondi in the Western Region of Ghana. Findings showed that the mentally challenged children had poor oral hygiene status with a mean score of 5.67, while the physically challenged children had a fair status with a mean score of 1.45.

The skill to manipulate the toothbrush and understand the teeth cleaning objectives are greatly required to effectively remove debris and plaque from teeth to ensure good oral hygiene<sup>11</sup>. However, the majority of the studies<sup>12, 13</sup> carried out to evaluate the oral hygiene status of mentally challenged people found poor oral hygiene levels as in this study.

Cutress et al.<sup>14</sup> found a high prevalence of periodontal disease in mentally and physically challenged. Our study also revealed a significant difference in the oral hygiene levels of those who are mentally challenged and those who are physically challenged. Rao et al.,<sup>15</sup> also reported that the oral hygiene levels in physically challenged children were better than intellectually disabled children in their study. The mean OHI-S of physically challenged children in their study was found to be 2.39 as compared with that of this present study of 1.45

The better oral hygiene levels in physically challenged people can be attributed to the fact that they can comprehend the need for practicing good oral hygiene and can understand instructions given by caregivers. In contrast, for mentally challenged children, poorer oral health has been attributed to low powers of concentration and lack of motor skills<sup>16</sup>. However, this may be due, in fact, to neglect and lack of adequate and diligent oral care from caregivers. This is comparable to the observation

that children's teeth can generally be kept very clean without the kids' understanding but purely by good oral hygiene from parents.

Therefore, oral health may be affected by the limited understanding in children with intellectual needs and difficulty in communicating oral health needs. In addition, on the whole, societal care of these groups of children seems to be inadequate with poor oral hygiene practices and a lack of proper supervision by caregivers and parents.

Even though many efforts have been made in the western world to improve the oral health status of challenged individuals, not much attention is given to this serious issue in Ghana and Africa. The health authorities, social services, medical and dental professionals should alleviate the oral health negligence faced by this group.

The dental profession should be aware of its responsibilities and be prepared to improve the dental health of challenged children. Prevention should be the main objective, as these patients are often apprehensive and uncooperative in the dental clinic. Adequate follow-up of daily oral hygiene practices in self-sufficient handicapped individuals is needed. There is a strong need for improved education on chemical plaque control and in-service training programs on oral hygiene to the concerned groups. Parents and caregivers should also be given suitable oral health education.

The present study is limited by a small number of respondents present in the institution who were cooperative during the examination. (This prevented statistical analysis of any significant differences between the two groups, the sex and age differences).

## CONCLUSION

In conclusion, the findings from the oral hygiene status among the two groups studied in Sekondi showed that the oral hygiene status among their students was much poorer in the mentally challenged than the physically challenged group. However, the study was limited by the small number of respondents present in the selected institutions.

## REFERENCES

1. Bear P. N. and Benjamin S. D. (1974) Periodontal disease in children and adolescents. 1974, J.B Lippincott Company, pp 255–270
2. LOE H. (1978). The natural history of periodontal disease in man. J. Periodontal, 49 pp 607.
3. Nunn J. H. (1987) The Dental health of mentally and physically disabled children: A review of the literature. Community Dental Health. 4, pp 157 - 168.
4. Vigild M. (1985) Periodontal conditions in mentally retarded children. Community Dent. Oral Epidemiol. Vol.13, pp 180 - 182. 21.
5. Dental Care. *The Journal of Contemporary Dental Practices* 2007; 5(1)
6. Ehrlich and Torres. Essentials of Dental Assisting W.B Sanders Company. 2000.
7. A Manual on Oral Health Care, A `Health Learning Manual for Service Providers MOH/GHS.
8. Abdullah M. AL. Dosari and Abdellatif Hoda. Oral Health Status of Primary Dentition Among 551 Children Aged 6 – 8 Years in Jazan, Saudi Arabia. *Saudi Dental Journal* 2000; 12 (2).
9. Tesini D. A. (1980) Age, degree of mental retardation institutionalization and socio-economic status of mentally retarded individuals. Community Dent. Oral Epidemiol. Vol.8, pp 355–359.
10. Green J. C. and Vermillion J. R. (1964). The simplified oral hygiene index. J. Am. Dent Assoc, 68 pp. 7 - 13.
11. Pinkham JR. Oral hygiene in children: Relationship to age and brushing time. J Prev Dent 1975; 2:28-31. Back to cited text no. 14 [PUBMED]
12. Kumar S, Sharma J, Duraiswamy P, Kulkarni S. Determinants of oral hygiene and periodontal status among mentally disabled children and adolescents. J Indian Soc Pedod Prev Dent 2009; 27:151-7. Back to cited text no. 3
13. Hashim NT, Gobara B, Ghandour I. Periodontal health status of a group of (Non-institutionalized) mentally disabled children in Khartoum state. J Oral Health Community Dent 2012; 6:10-3. Back to cited text no. 15
14. Cutress T. W., Brown, R. H., and Barker D. S. (1977) Effects on plaque and gingivitis of a chlorhexidine dental gel in the mentally retarded. Community Dent. Oral Epidemiol, Vol. 5, pp. 78.
15. Rao D, Hegde A, Munshi AK. Oral hygiene status of disabled children and adolescents attending special schools of South Canara, India. Hong Kong Dent J 2005; 2:107-13.
16. Full CA, Kerber PE, Boender P, Schneberger N. Oral health maintenance of the institutionalized handicapped child. J Am Dent Assoc 1977; 94:111-3 [PUBMED]

