



## Prevalence of Dental caries among mentally disable school children Gezira State\ Sudan

### KEYWORDS

**Mogahid A. Yousif**

Dean faculty of dentistry u. of Geziera

**Abdulhameed H. Elmubarak**

Deputy Dean Faculty of Geziera

**Haydar E. Babiker**

Dean faculty of Medicine U. of Geziera

**ABSTRACT** *Objective:* To assess the present oral health status and prevalence of dental caries disease among children in Medani' school for children with special needs.

*Method:* The study tools were direct pre-coded questionnaires . The procedure involved dental clinical examinations to estimate the dental caries assessed by measuring, the decayed, missing and filled teeth (DMFT) index The study sample covered all mentally disabled pupils in school of special needs in Wad Medani city ( n = 64) .

*RESULTS:* The results revealed a poor level of oral hygiene and oral health services reflected by the presence of a high level of decayed and missing component of DMFT. The missing teeth were mainly due to increased extraction of dental caries. The mean DMFT index was estimated (9.4), which is statistically significant. This DMFT score exceeds the WHO stated DMFT score to achieve the goals for standard oral health. This study showed a higher DMFT score than a previous study in a former central state included Gezira Province which indicated high prevalence of dental caries and poor oral health services.

*Conclusion:* The study documented a high prevalence of dental caries due to poor provision of dental services in both quantity and quality at Gezira Province for students of special needs. The preventive measure has to be restructured to decrease high dental caries prevalence among this neglected groups of pupils.

### INTRODUCTION

Dental Caries is a dynamic process involving the exchange of calcium and phosphate ion between tooth structure and saliva in the presence of acids produced by the fermentation of carbohydrate by oral micro-organisms according to the epidemiological triad, environment, host, agent.<sup>1,2,3</sup>

DMFT rates tend to rise with age, as there are many factors that increase dental caries and DMFT, environmental rather than genetic factors play a predisposing role not a causal one in dental caries. The health system for dental care delivery is probably strongly influenced the relationship between DMFT rates and socioeconomic status. Regardless of the system, low-income groups have less filled teeth than high-income groups, while the number of decayed and missing teeth is inversely related to income and to the level of education. However, there is strong positive correlation between socio-economic factors such as educational level, income, dietary habits and dental caries in African populations. DMFT represent the cumulative impact of all caries. At the societal level mean DMFT score indicates the overall impact of oral health care system, caries prevention, treatment measures and other social, cultural and economic factors. The proportion of each component reflects the degree to which the oral health care system successfully treats dental caries. DMFT in central state in the school children and older people 3.2 and 6.4 respectively.<sup>4</sup> Caries indexes using DMFT/DMFS did not significantly correlate with flow rate, buffering capacity,, and showed no significant association with prevalence of species ( $p > 0.05$ ) There is no association between clinical picture and salivary or molecular parameters in Down syndrome subjects.

Mentally disabled individuals had significantly more missing teeth when compared with controlled group encouraging early regular contact with dental care to decrease and control caries and predental diseases.<sup>5,6</sup>

Down syndrome (DS), or Trisomy 21, is a genetic disorder which results in intellectual impairment, typical craniofacial features and a wide spectrum of phenotypic abnormalities. Children with Down syndrome showed lower caries prevalence, although the group had poor oral hygiene. The improved oral health services targeted toward groups with special needs could generate outcomes comparable to those seen in other service users and it may hold true for other underserved populations.<sup>7,8</sup>

The caries incidence was low, on average 0.51 new lesions per yr. Persons with mild intellectual disability experienced more caries than other intellectual disable individuals. Thus, the major part of the persons with intellectual disability showed satisfactory oral health. Normalisation, integration, equality and deinstitutionalisation of mentally retarded (MR) individuals has been accepted in Sweden community. Less restrictive living of MR were correlated to a high caries prevalence. High levels of mutans streptococci and growth of *P. intermedia*/*P. nigrescens* decreased after deinstitutionalization. and regular dental care.<sup>9,10</sup> DS, were compared with two similar healthy control groups and non-Down institutionalized mentally retarded patients. The pH levels did not differ significantly among the three groups. Down adults, who were caries free, had significantly lower *S. mutans* counts compared with the patients with caries. There was a considerable difference in caries prev-

alence in Down's syndrome patients and controls groups, the Down's syndrome patients having a lower overall prevalence which was most noticeable with respect to interproximal lesions<sup>11,12</sup>.

MR population with poor ability to cooperate with dental treatment showed an increased risk for impaired oral health and had lost the most of their teeth compared to normal populations. Orientation efforts are integrated with those of a motivated dentist, dental hygienist, and staff, a well-planned curative and preventive dental health program can lead to a high degree of success in the prevention of dental diseases in young populations with special needs. This is most desirable, as preventing methods but are quite inadequate.<sup>9,10,13,14</sup>

This study aims To assess the present oral health status and prevalence of dental caries among Wad Madeni school children of special needs, using DMFT & dmft indices and formulate strategy and policy for promoting dental health services aiming at achieving a good standards of oral health to attain appropriate reduction in dental caries prevalence for this important category which is in increasing number

**Material and methods :**

Study area: This study carried in Wad Medani school for children with special needs, the only public school for those group of children in the town and outside the Capital.

**Study population and sampling.** The school is mixed, the ratio male to female is almost 0.4:0.3. The total number of pupils were 64, all pupils in the school of all classes are included in these study (full coverage) the same number

of healthy primary school pupils with similar ages and sex were included in this study as control group

Tool of data collection: 1-School record 2- school teachers Interview 3-Simplified WHO basic oral health assessment form was used to assess DMFT. The students were examined by dentists using mirror, dental explorer and under day sun light to assess dental caries prevalence (DMFT) and dental plaque.

Oral Health Situation Analysis: The part of investigation aims at estimating caries prevalence measured by the DMFT index. The index components are: decayed (D), missing (M) and filled (F) tooth (T). It was used to get estimation illustrating how much the dentition until the day of examination has become affected by dental caries. It was either calculated for 28 (permanent) teeth, excluding the wisdom teeth, or the 32 teeth. The WHO recommends 32 teeth (WHO 1987).

Plaque OR Calculus index = The total scores of segments or sextant of the upper jaw (Anterior, left and right) + the total segment or sextant of lower jaw/ the number of sextants.

Oral hygiene index= Plaque index + Calculus index

Statistical Analysis Method: SPSS and Microsoft window descriptive statistic used to check, adjustment, analyse and compare the data.

**Results:**

The total number of cases is 64 mainly aged between 5 and 27 years (Table 1). Parents jobs showed that mothers were mainly house wives and fathers are mainly free labourers.

**TABLE 1: Shows the distribution and number of MR study group according age group**

Mental disability	5-8	9-13	14-17	18-21	21 >-
Down syndrome	8	13	8	0	4
Mental disorder`	2	3	4	5	1
Learning disability	1	2	5	0	0
Physical\ Mental disorder(C.P)	0	0	0	1	0
Hydrocephalus	2	1	1	0	0
Epilepsy	1	0	2	0	0
<b>Total</b>	<b>14</b>	<b>19</b>	<b>20</b>	<b>6</b>	<b>5</b>

**Table( 2) show sample distribution according gender**

Mental disability	Male	Female
Down syndrome	20	13
Mental disorder`	7	8
Learning disability	6	2
Physical\ Mental disorder(C.P)	0	1
Hydrocephalus	3	1
Epilepsy	1	2
<b>Total</b>	<b>37</b>	<b>27</b>

Tooth brushing practice and attitude showed remarkable differences between pupils 33 were cooperative 17 were reluctant but responded by continuous enthusiasm on training the rest 14 were obstinate to respond

**Table (3) shows and compares oral hygiene indices among different mentally disabled pupils and control study groups**

Mental disability	Plaque Deposit index	Calculus index	Oral Hygiene
Down syndrome	0.84	0.280	1.12
Mental disorder`	0.96	0.510	1.47
Learning disability	0.85	0.50	1.35
Physical\ Mental disorder(C.P)	0.5	0.50	1.0
Hydrocephalus	0.54	0.250	0.79
Epilepsy	0.83	0.660	1.49
<b>Total disable index</b>	<b>.850</b>	<b>0.370</b>	<b>1.22</b>
<b>Control group index</b>	<b>0.25</b>	<b>0.04</b>	<b>0.29</b>

**Table (4) show number of pupils having dental caries among school children with MR' syndrome (No caries free pupils).All school children suffered of caries**

<b>Mental disability</b>	<b>No.</b>	<b>With dental caries</b>	<b>%</b>
Down syndrome	33	33	100%
Mental disorder`	13	13	100%
Learning disability	10	10	100%
Physical\ Mental disorder(C.P)	1	1	100%
Hydrocephalus	4	4	100%
<b>Epilepsy</b>	<b>3</b>	<b>3</b>	<b>100%</b>
<b>Total disable pupils</b>	<b>64</b>	<b>64</b>	<b>100%</b>

The indicators of dental caries are shown in table (5) showed high prevalence of dental caries among study group of MR syndrome this is reflected by a high DMFT index (9.6) compared to ( 4.1) of the control group

**Table 5: The magnitude of dental caries index DMFT in study and control groups**

<b>Mental disability</b>	<b>Decayed</b>		<b>Missed</b>		<b>Filled</b>		<b>DMFT</b>
	<b>D</b>	mean	<b>M</b>	mean	<b>F</b>	mean	
Down syndrome	275	8.3	37	1.1	1	0.03	4.9
Mental disorder`	95	8.9	6	4.0	0	0	2.10
Learning disability	72	.57	6	6.0	0	0	5.8
Physical\ Mental disorder(C.P)	12	6	4	2	0	0	8
Hydrocephalus	17	5.8	2	1	0	0	5.9
Epilepsy	24	8	2	7.0	0	0	7.8
<b>Total</b>	<b>495</b>	<b>7.7</b>	<b>57</b>	<b>9.0</b>	<b>1</b>	<b>02.0</b>	<b>62.9</b>
<b>Control group</b>	<b>184</b>	<b>92.</b>	<b>72</b>	<b>1.1</b>	<b>7</b>	<b>.10</b>	<b>.14</b>

## DISCUSSION

This study documented information on the current status of dental caries among school children of special needs in Wad Medani. The main findings showed that females and males were equally affected with dental caries without regard to their sex and age and the prevalence of dental caries did not differ in same age and gender of mental disable pupils. This finding agree with which reported in literature .The Down syndrome children, when compared with two control groups of similar gender and age ranges of healthy children and non-Down mentally retarded (MR) children living in the same institution ,caries experience as indicated by decayed, missing, and filled surfaces (DMF-S) showed significantly lower mean scores for the Down syndrome group compared with both control groups.<sup>15</sup>

Mental disability and poor awareness and understanding were highly reflected and affected in health education and digestion of preventive message which effect negatively in improvement of oral hygiene as shown in this study.

Tooth brushing behavior was not common among the studied population. A great proportion (21,9) were not brushing while(26.6) were reluctant but responded by continuous enthusiasm on training to brush their teeth. Increased awareness of the role of this behavior in maintenance of good oral hygiene to reduced dental caries was expected. This observation was supported with those reported by Ahlberg J et al. (1996).<sup>16</sup> They reported the positive relationship between tooth brushing, high education and socio economic level and dental caries prevalence.The poor oral hygiene that is caused by more deposit of dental plaque and calculus among study individuals was main cause of dental caries.

This was differ of what documented in previous study, the individuals with DS had fewer filled (  $p=0.017$ ) and fewer decayed (  $p=0.007$ ) teeth than the control individuals and they had bad oral hygiene with a significantly higher percentage of surfaces with detectable plaque (  $p<0.001$ ).<sup>17</sup>

The present study showed that the extraction of teeth was only type of available treatment although of high preva-

lence of dental caries ,which revealed the big magnitude of dental caries parameters such as high DMF. This may be due to many factors including level of awareness, availability of services and socioeconomic status. These findings were supported by other studies Chen et al (1997) and yousif(2009).<sup>18,19</sup>

YOUSIF(2007) reported that number of decayed and missing teeth is inversely related to income, level of education and water fluoridation.<sup>4,18</sup> The DMFT mean score indicates the overall impact of oral health care system, caries prevention and treatment measures and other social, cultural and economic factors. High income and use of refined food increase dental caries. The proportion of each DMFT components reflect the degree and success in dental caries treatment<sup>18</sup> . Also Nakajima (1994) stated that in developing countries the situation beginning to deteriorate where dental caries and other oral diseases are in increase<sup>20</sup>

Ghandour and Ibrahim (2001) reported high DMFT score in Gezira state and Wad Medani locality 6.2, and 6.7 respectively. Also previous study in this State, explained the DMFT for school children was 3.2 while it was 6.4 for older people<sup>21</sup> . The findings of present study of mental disable sample showed high prevalence of dental caries which reflected by DMFT score(9.6) when compared with a previous study of normal healthy individual.This high DMFT attributed to poor oral health status ,abnormal tooth morphology and composition, addition to host and environmental factors and deficit of quantitative and qualitative of dental health services. Shore S LightfootTetal. In their study draw attention to the environmental and host factors, and modifiable risk factors those associated with causation and progression of dental caries in children with Down syndrome, which apply to the children with learning disabilities<sup>22</sup>.

This study was obviously differ when compared with all studies made in Europe or Asia in the similar groups of mentally disabled pupils and normal individuals (control group). The study in the Sudan show higher prevalence and incidence of dental caries among mentally disabled individual than in normal individual, that may be explained

to the absence of community and school-based healthcare professionals act in promoting good oral health using evidence-based preventative and curative strategies,

Also the study documented that all sample of mentally disabled children were suffering of dental caries, although there was no clear cut variation in DMFT between different study categories of mentally disabled. The DMFT in mental retard pupils was (10.2), hydrocephalus pupils was (9.5), D.S was (9.4) and epileptic pupils was (8.7). This results agree with what explained by Ulseth JO, et al. The caries rate, however, did not differ demonstrably between persons with mental retardation and groups of similar gender- and age<sup>23</sup>.

## CONCLUSION

All stated results in this study showed a large magnitude of dental problem among school children of Wad Medani special needs school as indicated in this study by a high DMFT index, faced with meager preventive and curative dental health services and community care. A tremendous effort and commitment from the state national and federal government is highly needed to reduce the dental caries prevalence, (DMFT) using different approaches including construction of especial school dental health programme.

## RECOMMENDATIONS

There is an urgent need to construct a strategy not policy for comprehensive preventive and promotive oral health care for this neglected group of people. This plan should be flexible and properly adjusted according to the present level of demand to achieve national goals. The following recommendations are suggested to make this plan feasible.

- Creation of a system to collect demographic, epidemiologic and clinical records information for school children of special needs.
- A priority should be given to health promotion, prevention, disease control and complementary restorative care of high quality.
- Promotion of appropriate self care, dietary advices and Construction of water fluoridation system supply in schoolchildren of special needs students
- Participation of consumers and communities in organization and implementation and financing of health care programme specially design for school children of special needs.

## REFERENCE

- 1- Arathi Rao, dental caries etiology and classification principles and practice of pedodontics. 2nd edition 2008, p164-181 2-Chandra; Stash; Chandra; Shaleen. Prevention of oral and dental diseases p140: In Community Dentistry 2nd edition – New Delhi, 2002; p. 134-138. 3-Ivor G. Chest Nutt. OxHord Clinical Dentistry. Text Book, 2001 4- Yousif, A.M. 2004. Dental Caries in Gezira Province, Gezira Journal, June 2007, volume 3, no. 1, p. 61. 5- D Castilho AR, et al Dental caries experience in relation to salivary findings and molecular identification of *S. mutans* and *S. sobrinus* in subjects with Down syndrome. PubMed 2010 May-Jun;30(3):118-23. 6-Khocht A, et al Periodontal health in Down syndrome: contributions of mental disability, personal, and professional dental care. PubMed 2010 Feb;83(2):18-21 7. Boyd D, The Down syndrome patient in dental practice, Part II: clinical considerations 2004 -Apr;24(2):55-60 8-Bradley C, McAlister T. The oral health of children with Down syndrome in Ireland. PubMed - 2003;27 Suppl 2:75-82. 9-Gabre P, et al. Longitudinal study of dental caries, tooth mortality and interproximal bone loss in adults with intellectual disability. PubMed 2000;(142):1-48. 10-Gabre P. Studies on oral health in mentally retarded adult. PubMed 1996 Jan-Feb;16(1):33-7. 11-Shapira J, et al. Caries levels, Streptococcus mutans counts, salivary pH, and periodontal treatment needs of adult Down syndrome patients. PubMed - 1991 Sep-Oct;11(5):203-8. 12-Barnett ML, et al The prevalence of periodontitis and dental caries in a Down's syndrome population. PubMed - 1976 Sep-Oct;43(5):313-20. 13-Shapira J, et al A comprehensive 30-month preventive dental health program in a pre-adolescent population with Down's syndrome: a longitudinal study. PubMed - 1991 Nov-Dec;11(6):248-51. 14-Brown JP, et al A review of controlled surveys of dental disease in handicapped persons. 15- Stabholz A., et al Caries experience, periodontal treatment needs, salivary pH, and Streptococcus mutans counts in a preadolescent Down syndrome population. PubMed - 1991 Mar-Apr;11(2):71-3. 16-Ahlberg J, Tuominen R, Murtomaa H. Dental knowledge, attitudes towards oral health care and utilization of dental services among male industrial workers with or without an employer-provided dental benefit scheme. Community Dental Oral Epidemiol, 1996 Dec; 24(6):380-4. 17-Cheng RH, et al. Oral health status of adults with Down syndrome in Hong Kong. PubMed 2011 Jul;99(2):162-7. 18-Chen M R; Adersen M D; Barmos E M; Leclerca H C; Lyttle S. WHO comparing oral health care systems. A second international collaborating study. WHO Geneva in collaboration 19. Yousif, A.M. Dental services in Gezira Locality. Sudanese Journal of Public Health in Dental 2009 July 4(3) 325-330 20 --Nakajima H. Editorial world with center for health administration study University Chicago, 1997 health day, 1994-oral health for a health life, world health the Magazine of the WHO 47th – year oral health 1994; 1: 1 21. Ghandour I A; Ibrahim Y E. National oral health plan for Sudan (2001-2005) short term WHO consultancy. Assignment report CSA 99/165 (unpublished) 22- Shore S, et al Oral disease in children with Down syndrome: causes and prevention. PubMed 2004 Mar;100(1):4-9. 23-Ulseth JO, et al Dental caries and periodontitis in persons with Down syndrome. PubMed -1989 Oct;38(10):1095-103.