

Dental Treatment Needs of Children with Disabilities

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Abstract

Background and aims. Children and adolescents with disabilities appear to have poorer oral health than their non-disabled counterparts. The aim of this study was to assess the frequency and severity of oral diseases and treatment needs using world health organization criteria of caries, periodontal disease and mal-occlusions in a selected population of children with disabilities in Mashhad, Iran.

Materials and methods. A randomized study on 1621 children aged 5-16 was conducted in 13 special schools by six examiners, using a mouth mirror, explorer and enough lighting.

Results. The caries frequency of hearing impaired children (HI) was lower than those mentally retarded (MR) and visually impaired (VI) (DMFT: 2 ± 1.91 versus 2.27 ± 1.97 and 2.68 ± 2.30 , respectively). MR children appear to have poorer oral hygiene and periodontal status than their otherwise disabled counterparts. Most children had class I malocclusion (57%).

Conclusion. According to this study, an epidemiological survey followed by the implementation and evaluation of long-term public dental health care plan for children and adolescents with disabilities is highly recommended.

Key words: Dental caries, disabled children, DMFT index, epidemiology, periodontal diseases.

Introduction

It is believed that the number of handi-capped individuals is increasing in proportion to the general population.¹ Dental care is the most common unmet health care need of disabled children.²

Children and adolescents with disabilities appear to have poorer oral health than their non-disabled counterparts. Variable access to dental care, inadequate oral hygiene and

disability-related factors may account for differences. A study on dental health and dental care requirements of young handi-capped adults in Wessex demonstrated that the amount of untreated caries was higher and the periodontal status was worse in this group than would normally be expected in young adults in this age range.³ Arnrup demonstrated that gingivitis, disturbances in occlusal development and dental caries were

the most commonly found diagnoses in medically compromised children.⁴

The objectives of the present study on a selected group of disabled children in Mashhad were (1) to determine the frequency and severity of their oral disease, (2) assess their treatment needs with reference to dental caries, periodontal disease and malocclusion, and (3) make recommendations for public dental health care for individuals with disabilities.

Materials and Methods

Study Design

The present study was conducted between September and March 1996, in 13 special schools in different socio-economic areas in Mashhad, Iran. From 3000 children attending special schools, 1621 individuals (609 females and 1012 males) 5 to 16 years old, were eligible and examined.

Clinical Environment and Examination

All examinations were performed at schools while children were seated on a chair with a fixed artificial light directed towards the mouth. The diagnosis of dental caries was undertaken by visual examination using a dental mirror and an explorer utilizing the criteria recommended by world health organization.

The dental examination was carried out by a final year dental student. The examiner was trained and supervised by a pedodontist.

Indices used to measure caries experience include dmft + DMFT and dental treatment needs.⁵ The OHI-S by Green & Vermillion was used to assess oral hygiene.⁶ This index has two components: the debris index (DI-S) and the calculus index (CI-S). Six surfaces from six teeth (one surface of each tooth) are examined to determine OHI-score:

6	1	6	E	A	E
6	1	6	E	A	E

Debris and calculus scores were obtained through examining the buccal or lingual surface of the teeth. The gingival condition of each case was scored using the gingival index (Jackson & James).⁷ Occlusion was recorded according to the Angle classification

system and in cases of primary dentition, it was recorded according to the terminal plane of the second primary molars.¹

Dental Needs and Recommendations

The dental treatment needs of each child was assessed based on the following categories: None: no restorative treatment required; Simple: preventive treatment required, such as scaling and brushing, oral hygiene instruction (OHI), application of topical fluoride and fissure sealant; Moderate: one or more teeth require one or two surface restoration; and Complex: one or more teeth require a three or four surface restoration/stainless steel crown, endodontic therapy and crown, and/or extraction.

The recommendations were based on dental treatment needs, classified as follows: No treatment required: child required no dental or periodontal treatment, but required assistance with oral hygiene; Simple treatment need: child required simple preventive or periodontal treatment; Moderate treatment need: child required moderate dental and/or periodontal treatment; and Complex treatment need: child required complex dental and/or periodontal treatment. The Findings of the present study are presented as descriptive data.

Results

Distribution of Children

Table 1 shows the gender and disability distribution. More than one half of the study populations (60%) were mentally retarded.

Dental Status and Need for Preventive and/or Restorative Treatment

The majority of children (81.7%) were caries free. The caries experience of children with hearing impairment was lower than that of the children with mental retardation and visual impairment (d+D: 1.51, 2.05, and 2.28, respectively; dmft + DMFT: 1.91 ± 2 versus 2.27 ± 1.90 and 2.68 ± 2.30). The filled component in MR children was lower than VI and HI children (f+F: 0.077, 0.14, and 0.18, respectively). The number of missing teeth due to caries in MR children was

Table 1. Distribution of children according to gender and disabilities

Disability	Gender				Total	
	Male		Female		No.	%
	No.	%	No.	%		
Visual impairment	98	6.05	77	4.75	175	10.80
Hearing impairment	224	13.8	238	14.68	462	25.50
Mental retardation	690	42.56	294	18.14	984	60.70
Total	1012	62.43	609	37.57	1621	100

Table 2. Distribution of children by dental status and need for preventive and/or restorative treatment

Disability	Mental retardation		Hearing impairment		Visual impairment		Total children	
	n= 984		n= 462		n=175		n= 1621	
Dental status	No.	mean score	No.	mean score	No.	mean score	No.	mean score
Decayed teeth (d+D)	2023	2.05	701	1.51	400	2.285	3.24	1.914
Missing teeth (m+M)	140	0.141	97	0.209	43	0.245	180	0.171
Filled teeth (f+F)	76	0.077	85	0.183	26	0.148	187	0.114
Need for preventive and/or restorative treatment	No. of children	(%)	No. of children	(%)	No. of children	(%)	Total Children	(%)
None	0	0	0	0	0	0	0	0
simple	227	23.1	157	34	43	24.6	427	26.3
Moderate	503	51.1	221	47.9	63	47.9	789	48.5
Complex	254	25.8	84	18.18	67	38.28	407	25.1

n = Number

also lower than the HI and VI children (m+M: 0.14, 0.20, and 0.24, respectively).

The mean fd, FD indices for MR children was lower than those of VI and HI children (MR = 0.037, VI = 0.065, and HI = 0.12), indicating lower amount of restorative treatment relative to untreated caries in MR children. The decayed component of mean dmft+DMFT index was the largest component of the index in all three groups.

Periodontal Status and Occlusion

Table 3 presents oral hygiene status in the examined population. Our findings indicate

that 49.04% of patients had unsatisfactory oral hygiene status. Gingival index was fair in most children (66.37%) and mentally retarded children had the worst status among the other groups.

DI-S in MR children (67.29%) and CI-S in HI children (5%) were higher than the other group. There was a significant difference in the distribution of the Angle classification of occlusion, with a higher percentage of class I malocclusion in the handicapped subjects. Class I malocclusion in hearing impaired children was more seen.

Table 3. Distribution of children by OHI-S gingival status, need for periodontal therapy, malocclusion status and need for orthodontic therapy

Status & need for Therapy	Classification	Distribution of children (%)			Total children n= 1621
		MR n=984	VI n=175	HI n=462	
OHI-S	Good	384(39.02)	88(50.28)	313(67.75)	785(48.42)
	Fair	597(60.67)	87(49.72)	111(25.02)	795(49.04)
	Poor	3(0.31)	0(0)	38(8.23)	41(2.54)
Gingival status	Good	143 (14.53)	49(28)	236(51.08)	428(26.4)
	Fair	774(78.65)	119(68)	183(39.61)	1076(66.37)
	Poor	67(6.82)	7(4)	431(9.31)	117(7.23)
Need for periodontal therapy	None	143 (14.53)	49(28)	236(51.08)	428(26.4)
	OHI only + p	774(78.65)	119(68)	183(39.61)	1076(66.37)
	OHI only + (p & s)	67(6.82)	7(4)	431(9.31)	117(7.23)
Malocclusion Status	Class I	547(55)	104(60)	294(64)	929(59)
	Class II	349(36)	63(36)	122(26)	544(33)
	Class III	92(9)	7(4)	47(10)	152(10)

n = Number

Discussion

A number of surveys and controlled studies have been conducted to determine the effect of some disabilities on the prevalence of oral diseases. The mean dmft + DMFT of 2.2 ± 2.8 was reported by Mala Desai for 9-13-year-old children with disabilities. This finding is consistent with our study (mean dmft + DMFT = 2.2 ± 2) in which the decayed component was the major contributor to the dmft + DMF index.

Nunn et al reported mean deciduous caries experience (dft) to be 0.9 and the mean permanent caries experience (DMFT) 2.0 in a study on physically handicapped children in 1993.⁸ The mean dfs/DMFS values were 2.5 and 3.4 respectively. Alavi et al reported mean DMFT of 9.64 ± 4.64 in diabetic children in 2006. DMFT score and the frequency of decayed teeth were higher in boys than in girls.⁹

Our study showed that a considerable number of HI children (34%) were caries free. Mean deciduous caries experience (dft) was 0.23 and the mean permanent caries experience (DMFT) was 5.69. The differences between our study and Nunn's can be

attributed to variations in age and number of the cases (5-16 year olds versus 3-17 year olds; 1621 versus 129, respectively).

Ivancic reported that the average DMFT index in disabled children was 1.14 for mixed and 6.39 for permanent dentition. They suggested reorganizing preventive care measurements and improving dental care for disabled children.¹⁰

In this study, the dental caries prevalence in VI subjects was higher than MR and HI subjects, which is contrary to Swallows' results.¹¹ The lower prevalence of caries in hearing impaired subjects suggests that HI children have higher ability to learn oral hygiene in comparison with other groups.

In the present study the mean DMFT of 12-year-old children with disabilities (2.59) was higher than those of the Mala Desai and Nunn studies, but lower than the WHO goal of 3.0 for year 2000.¹²

Al-Qahtani reported that all 6-7-year-old blind children had caries with a mean dmft of 6.58. Caries prevalence in 11-12-year-old blind children was 88.2% with a mean DMFT of 3.89. A good oral hygiene was

found in 8.3% of 6-7-year-old, and 29.4% of 11-12-year-old blind children. The caries prevalence in the 6-7-year-old deaf children was 95.7% with a mean dmft score of 7.35. The caries prevalence in 11-12-year-old deaf children was 93% with a mean DMFT of 5.12. Less than one-fifth (17.4%) of the 6-7-year-old deaf children and only 7.0% of 11-12-year-old deaf children had good oral hygiene. The caries prevalence in 6-7-year-old mentally retarded children was 93.9% with a mean dmft of 8.00. All of the 11-12-year-old mentally retarded children had carious teeth with a mean DMFT of 5.81. Only 3.1% of 6-7-year-old and none of the 11-12-year-old mentally retarded population had good oral hygiene.¹³ These findings are contrary to the results of our study.

The DMFT indices increased markedly with age in all three handicapped groups. This has been supported by several studies.^{1,14} The preventive and restorative treatment needs of many children in the present study were unmet. Contributory factors include inadequate funding and resources, insufficient trained dentists to treat patients with disabilities, and complex treatment needs requiring special care or general anesthesia.¹⁵

In general, oral hygiene of the handicapped children was poor. The average individual or group DI-S and CI-S scores are combined to obtain the simplified oral hygiene index (OHI-S). In this study children had poor or fair (44% and %42) DI-S, but CI-S index was very low, even zero in some cases. Therefore, in this age group OHI-S is indicative of DI. Poorer oral hygiene and gingival health in the studied children are consistent with the findings of other studies, which can be attributed to environmental, systemic and local factors.^{17, 10, 16} Local factors such as malocclusion, lack of normal masticatory functions, and attrition due to bruxism were more prevalent in those with severe disabilities; these have been suggested to contribute to periodontal disease. Therefore, optimal oral hygiene is of particular importance in this group in order to limit disease onset.¹⁷ The proportion of children requiring periodontal treatment in the present study was very high (74%) and the major needs were prophylaxis plus oral hygiene advice.

In the present study, 40% of the children showed malocclusions. Class II malocclusion was more seen in MR and VI children. Malocclusion can complicate the child's disability, resulting in dental trauma (e.g. a large overjet predisposes the children to trauma in those with seizures), periodontal disease (promoted by crowding or eruption problems), functional problems (mastication, drooling), speech impairment and even temporomandibular joint dysfunction.^{16,18}

According to this study, following recommendations are made concerning the public dental health care of children and adolescent with disabilities:

1. Greater coordinated efforts should be made by the dental, medical, and social services to serve their needs.

2. Individualized recall visits should be introduced to schools by dental teams to perform preventive measures, particularly for those at a high risk of caries and/or periodontal diseases.

3. Trained dental auxiliaries should be utilized. Following the examination, diagnosis and treatment planning by a dentist, a trained auxiliary could provide preventive care, simple restorations, fissure sealants, oral hygiene instructions and oral health promotion.

4. Access to general practitioners, pedodontists, and orthodontists should be improved, and referral mechanisms established whereby high risk children can obtain priority treatment.

5. Campaigns should be launched to decrease dental disease, through changing the school diet to limit cariogenic intake, instituting preventive training programs for staff, and advocating public health programs.

6. Education on the subject of oral health care in disabled individuals should be expanded in dental schools and higher education should be established to upgrade professional knowledge.

7. A national epidemiological survey should be conducted by experts in public dental health, in order to prepare and implement a long-term public dental health care plan.

8. The efficacy of the implementation of this plan should be evaluated subsequently in terms of oral health of the recipients.

Conclusion

The rate of caries, periodontal disease and malocclusion in disabled children exceeds that of children without disabilities. Preventive, restorative and periodontal treatment needs are unmet in handicapped children, despite the fact that only 26% of the cases required simple treatment. Following diagnostic examinations and treatment planning

by a dentist, a wide range of preventive, restorative and periodontal treatments could be performed by trained dental auxiliaries. An epidemiological survey followed by the implementation and evaluation of a long-range public dental health care plan for children and adolescents with disabilities is highly recommended.

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