

CARIES STATUS, TREATMENT NEEDS AND ORAL HEALTH CARE EVALUATION OF CHILDREN AND ADULTS ATTENDING A CENTER FOR SPECIAL HEALTH CARE NEEDS IN BOSNIA AND HERZEGOVINA

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ABSTRACT

Objective: The objective was to assess caries status and treatment needs at children with special healthcare needs being residents of the School for children and adults with special healthcare needs "Mjedenica" and to evaluate planned treatment efficiency after eight months period.

Subject and Methods: The research was conducted at the dental office established in the School specialized for children with special health care needs "Mjedenica", Sarajevo. The sample consisted of 124 respondents. Clinical examination was performed to assess caries status and treatment needs and to evaluate planned treatment after eight months period.

Results: The total number of residents in "Mjedenica" was 185, number of examined respondents was 124 and percentage of untreated caries was 85.48%, the percentage of teeth extraction needs was 39.51% and the percentage of filling teeth needs was 83.06%. The number of absolute noncooperative respondents was 49. After 8 months of intensive and dedicated dental treatment in the dental office "Mjedenica", the caries prevalence was reduced up to 22.95%.

Conclusion: Adequate treatment supported with efforts in preventive oral health care, continuous monitoring of oral health habits is fundamental for oral health improvement of individuals with disabilities and special healthcare needs.

Key words: oral health, individuals with special healthcare needs, treatment needs, caries prevalence.

Introduction

The American Health Association defines a child with disability as: „A child, who, for various reasons, cannot fully make use of all his or her physical, mental and social abilities – in other words, a child who cannot play, learn or do things that other children his or her age can“ [1]. They can also be defined as „Special health care needs (SHCN) children “because they have physical, mental, sensory, behavioral, emotional and chronic medical conditions requiring health care beyond those being considered as a routine [1, 2]. UNICEF Report estimates that there are at least 93 million children with disabilities in the world, but numbers could be much higher [3]. According to the World Report on Disability approximately one billion people in the world are living with a disability, and 80% is living in developing countries [4].

Oral health is essential to the general health of children and can affect the quality of life, especially if children have any disability [5]. Oral disease is a major health problem for individuals with disabilities and they have a higher prevalence and severity of oral diseases compared to the general population [6]. High rates of dental caries, missing teeth and other oral diseases are the indicators of poor oral health of children and adults with disabilities [7].

Children and adults with special healthcare needs are not often able to take care of their own oral hygiene, and often their parents/caregivers are not educated enough. That implies poor oral health and has consequences like dental caries, parodontopatics, gingivitis and other oral conditions. Risk factors of caries are the same for healthy individuals and those with special needs, but impaired oral hygiene and absolute and relative non-cooperation in dental treatment by individuals with special needs, makes preventive measures and necessary treatment more difficult to conduct [8].

Studies from Bosnia and Herzegovina in 2016 reported 83% of healthy preschool children affected with caries and 90% of children with Down Syndrome [5, 6]. The percentage of untreated caries in the most researches was over 60% [9, 10, 11]. Preventive programs and strategies for dental disease for children with special healthcare needs in the community are lacking. However, dental caries is a disease that can be prevented in time if preventive measures are applied. The key of prevention is to motivate, educate and raise awareness of parents/caregivers about the importance of oral health.

Periodical oral health surveys conducted for children with special healthcare needs is important for developing proper strategies for oral health care community-based programs for this high-risk population group.

The aim of this study was to assess caries status and treatment needs of children with special healthcare needs being residents of the School for children and adults with special healthcare needs "Mjedenica" and to evaluate planned treatment efficiency after an eight-month period.

Subjects and methods

School specialized for children and adults with special healthcare needs "Mjedenica" in Sarajevo, Bosnia and Herzegovina, is covered by Public Institution-Institute for special education and upbringing of children. Beneficiaries are from the whole territory of Bosnia and Herzegovina. Dental office was established in April 2019. Dental team was composed of one general dentist and one dental nurse. The main goal for established dental office was to assess dental status of residents and to provide treatment plan for each patient for complete rehabilitation and preventive strategy for long-term maintenance of oral health. Established dental office belongs to the Clinic of Preventive dentistry and Pedodontics being a part of the Faculty of Dentistry University of Sarajevo.

Total number of residents in the Institution in April 2019 was 185 individuals affected by different disabilities - Mental Retardation (MR), Autistic Disorder (AD), Down Syndrome (DS) and other (OTH). Information consent document for patient screening, treatment options and possible non-personal data use for educational and scientific purposes was offered to all parents/caregivers or legal representatives. Signed consent as an official document of the Faculty of Dentistry University of Sarajevo, approved by Education and Scientific Committee of the Faculty of Dentistry University of Sarajevo was a prerequisite for inclusion in the dental screening and further treatment. In the initial screening did not participate 61 residents for one of the following reasons: informed consent was not signed for 9 subjects, 49 weren't cooperative for screening and 3 left school before the screening was done. Total number of subjects screened for dental status and treatment needs was N=124.

The survey was done on the dental chair, using CPI-WHO dental probe (Community periodontal index type E by WHO dental probe) and plain dental mirror under artificial light, using air flow and cotton walls if needed for better visibility. Presence of caries was assessed in accordance to the World Health Organization (WHO) criteria [12]. After assessing treatment needs, eight-month treatment plan was developed for each participant. Dental team employed in the dental office was previously trained by experienced specialists for Preventive and Pediatric dentistry for initial dental status screening, treatment plan developing and conducting treatment and preventive actions. Treatment plan included decay treatment, tooth cleaning and polishing, fissure sealing, professional topical fluoridation, of oral health habits evaluation and instructions of healthy lifestyle for oral health improvement. Three independent trained researchers reviewed initial records for dental status and treatment plans at the beginning of the initial screening of dental status and treatment needs and eight months after the planned treatment outcomes.

Screening was done in a residential institution groups as follows:

- Group I: 8 children aged 0-7;
- Group II: 84 children aged 7-14;
- Group III: 10 children aged 14-18;
- Group IV: 22 adults aged 18+

Prevalence of caries was calculated as frequency and percentage of decayed teeth, missed teeth due to caries and filled teeth due to caries for total sample and by residential groups.

The results were analyzed by means of descriptive statistics as frequency of distribution and percentage. Statistics were done in Microsoft Excel for Mac, version 16.32.

Results

Total number of residents in the Institution was 185 children and adults with special healthcare

Type of disease	Male	Female	Total
Autism	28	8	36
Mild mental retardation	11	5	16
Mild mental retardation and autism	1	0	1
Psychomotor retardation	4	2	6
Moderate mental retardation	11	2	13
Moderate mental retardation and autism	1	0	1
Polymyalgia rheumatic	1	0	1
EPY	5	3	8
Down syndrome	0	3	3
Disorder of behavior and emotions	1	0	1
Speech disorder	1	0	1
Encephalitis and EPY	1	0	1
Combined disorders and syndromes*	6	2	8
No diagnosis**	56	33	89
Total	127	58	185

Table 1. Frequency of distribution of respondents by medical condition. (*includes disharmonic development, intellectual disability, speech delay, syndromes and other) (**no recorded medical diagnoses)

Study group	Absolute noncooperative	Cooperative for dental status	Cooperative for preventive measures	Cooperative for restoration	Absolute cooperative
Group I: age 0-7	8	2	6	-	-
Group II: age 7-14	28	18	40	8	18
Group III: age 14-18	3	-	2	5	3
Group IV: age 18+	10	1	13	-	8
Total	49	21	61	13	29

Table 2. Distribution of participants by cooperation for dental treatment presented in frequencies

Study group	Decayed teeth (%)	Missed teeth (%)	Filled teeth (%)
Group I: age 0-7	5 (4.03)	1 (0.8)	1 (0.8)
Group II: age 7-14	75 (60.48)	9 (7.25)	40 (32.25)
Group III: age 14-18	9 (7.25)	4 (3.22)	8 (6.45)
Group IV: age 18+	17 (13.71)	17 (13.71)	15 (12.09)
Total	106 (85.48)	31 (25)	64 (51.61)

Table 3. Results of the assessment of subjects affected with untreated caries, missed and filled teeth due to caries in different age groups presented in frequencies and percentages

Study group	Sample size	Caries free	No treatment need	Filling need	Extraction need
Group I: age 0-7	8 (6.45%)	1 (0.80%)	1 (0.80%)	5 (4.03%)	1 (0.54%)
Group II: age 7-14	84 (67.74%)	1 (0.80%)	7 (5.64%)	73 (58.87%)	37 (29.83%)
Group III: age 14-18	10 (8.06%)	0 (0%)	1 (0.80%)	9 (7.25%)	4 (3.22%)
Group IV: age 18+	22 (17.74%)	0 (0%)	4 (3.22%)	16 (12.90%)	7 (5.64%)
Total	124	2 (1.61%)	13 (10.48%)	103 (83.06%)	49 (39.51%)

Table 4. Percentage and frequency of caries free subjects and overview of treatment needs in different age groups

needs who are members of the School "Mjedenica" which included 127 male and 58 female residents with different medical diagnosis. The number of residents having no medical diagnosis recorded in their files was 89. Frequency of distribution of respondents by medical condition was given in Table 1. Parents/caregivers did not sign the consent for 9 residents and 3 left the School before initial screening was done, 49 was not cooperative for dental examination. Distribution of participants by cooperation for dental treatment is presented in Table 2. Total sample of examined individuals for dental status and treatment needs

was N=124. The percentage of untreated caries was 85.48%. Treatment needs for tooth filling was recorded in 83.06% and for tooth extraction in 39.51% of examined teeth. Results of the assessment of subjects affected with untreated caries, missed and filled teeth due to caries in different age groups are presented in Table 3.

There was only one child caries free in the youngest age group (Group I), and in the oldest age group (Group IV) there were two edentulous individuals with total prosthesis. Results of caries free subjects by study groups and treatment needs assessment is given in Table 4.

Eight months after the initial screening, patients' dental records were analyzed for treatment outcome. Twenty - eight children completed caries treatment with preventive and prophylactic care included. During 8-month period, 151 teeth was filled and 30 teeth were extracted, preventive treatment was provided regularly including education and monitoring of oral hygiene and diet, professional tooth cleaning local fluoridation and fissure sealing. By the end of eight -month period new cavities were not detected.

The goals of the dental office for children with special healthcare needs "Mjedenica" were to educate the parents/caregivers and the staff working with children with special healthcare needs about oral hygiene, dietary habits and the importance of regular dental visits, to implement regular dental care for optimal oral health achievement.

Discussion

Oral disease is serious health problem among individuals with disabilities [7]. The prevalence and severity of oral disease among this group are higher when compared to the general population [7]. The oral health of children and adults with special healthcare needs in our country is worrisome bad and not in line with international trends of continuous improvement. A lack of preventive programs and low motivation and knowledge of the whole population and especially caregivers/parents could be leading cause for such situation.

Of the total sample of screened subjects 85.48% had untreated caries. The frequency of dental caries was the highest among group III (100%). The review of epidemiological studies of oral health in population of Bosnia and Herzegovina revealed high caries prevalence's for all studied age groups [5, 13, 14].

Results of epidemiological study for 12-years-old healthy children in Bosnia and Herzegovina reported untreated caries in 45.4%, missed teeth 12.5% and filled teeth 42.1% [14]. If we compare the caries prevalence of healthy children and children with special healthcare needs of similar age, major difference could not be found. Healthy children had a higher number of filled teeth, and children with special healthcare needs had more extracted teeth. These results indicate differences in treatment plan due to limited dental procedures for children with special health care needs [14].

The study of oral health of Adults with Down syndrome in Bosnia and Herzegovina reported high DMFT value of 15.9 for participants aged 19 to 49 [6]. The results of tested parameters of oral hygiene (plaque, gingival and calculus index) in previous studies indicate low oral hygiene practices and serious lack of systematic preventive practices [5, 6, 13, 14, 15].

Case-controlled study conducted in Serbia reported statistically significant higher mean dmft/DMFT values in both dentitions for children with special health care needs than for healthy children [16]. Authors compared dmft/DMFT among the study subgroups (autism, cerebral palsy and mental retardation), and no statistical significance was observed [16]. Serbian authors considered that medically compromised children were taken to the dentist usually when they had experienced symptoms of acute pain, and that higher incidence of caries could be due to the lack of awareness about the importance of regular dental visits and both preventive and prophylactic care [16]. High caries prevalence for this population was reported in Kosovo with the percentage of 82%, and Croatia where reported DMFT for individuals with cerebral palsy was 18.5 [10, 17]. A poor collaboration of disabled children usually doesn't leave much space for a dentist in planning further dental treatments requiring complex restorations and/or endodontic treatment. Unfortunately, the most cases would therefore end up with extractions, as a treatment

choice. Kakaounakiet al., reported that 82% of interventions in children with disabilities were extractions, MacPhersonra et al., presented that 96% of cases of extractions were performed in general anesthesia and 48% in local anesthesia. According to Hosey at al., there was an increasing trend in the number of extractions in the period of 13 years varying from 26% up to 74% of cases. Similar problems such as the insufficient care and unsuccessful dental care for children with special healthcare needs, were presented by different authors and in many other countries [17, 18, 19, 20].

In the study from Nigeria in 2019, the prevalence of periodontal disease was 96.1% for the children and teenagers with special healthcare needs and the most of them had gingivitis (88.8%). Only 3.9% had healthy periodontium [21]. The mean dmft/DMFT scores was 0.02, and the untreated caries was 49% [21]. Indian study in 2015 had a low score of reported dmft/DMFT as 2.5. The same study reported up to 53.7% of the total population required oral prophylaxis, 33.3% required restorations on their posterior teeth and 12.9% required veneers for labial facing of hypoplastic enamel, 9% required orthodontic treatment and 7% required extractions [22]. Differences in epidemiological data for caries and periodontal diseases prevalence among countries could be related to the established community preventive health care system, socio-economic status and genetic related factors affecting incidence of periodontal disease occurrence worldwide [23].

Studies from developed countries in Europe, USA, Canada and others related to the oral health of children with special health care needs are very rare. The study conducted in Netherland in 2008 reported 57.4%, of children with untreated caries, while dentists considered communication problems as the most important barrier to the treatment [24]. Dutch non institutionalized children with severe disabilities still receive a relatively low degree of quality dental care [24].

Studies also showed that children with severe disabilities could have lower recorded dmft/DMFT when compared to children with mild or moderate disabilities [25, 26]. It is probably because caregivers/parents of children with severe disabilities are more dedicated and motivated in general.

Eight months after an intensive and dedicated dental treatment in dental office "Mjedenica" the caries prevalence is reduced up to 22.95% indicating that adequate treatment supported with efforts in preventive oral health care, continuous monitoring of oral health habits is fundamental for oral health improvement in individuals with disabilities and special health care needs.

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