MONITORING THE QUALITY OF ORAL HEALTH AMONG SCHOOLCHILDREN

PRAĆENJE KVALITETA ORALNOG ZDRAVLJA KOD POPULACIJE ŠKOLSKE DECE

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Summary
Introduction. Improvement of the quality of dental care is necessary for efficient prevention of oral diseases. The aim of this study was to analyze: the efficiency of the recommended work quality parameters in the Dental Health Care Service of the Health Center Zemun in 2014 and 2015; compare 7- and 12-year-olds in terms of having all healthy teeth and topical application of fluoride; presence of orthodontic anomalies in 12- and 14-year-olds, and assess the carries index (decayed-missing-filled teeth) in 12-year-old children. Material and Methods. The retrospective study included 7-, 12-, 14-, and 18-year-olds and assessed their oral health in 2014 (n = 4.317) and 2015 (n = 6.575). Results. A higher percentage of examinees kept their dental appointments in 2015 than in 2014 (82% and 60%, respectively). Out of 3.723 seven-year-olds, 36.6% had all healthy teeth, as well as 43.69% out of 3.170 of 12-year-olds. Out of 3.723 seven-year-olds, 65.26% had topical application of fluoride, as well as 78.73% out of 3.170 of twelve-year-olds. High percentages of orthodontic anomalies were found in both fourteen and eighteen-year-olds in 2015 (p<0.05). The average decayed-missing-filled teeth index in twelve-year-olds was 1.30 in 2014 and 1.68 in 2015. Conclusion. A higher percentage of all healthy teeth, and of topical application of fluoride in twelve-year-olds compared to the seven-year-olds, indicates that seven-year-olds keep their dental appointments more regularly, and consequently the prevention of oral diseases is more successful. Since the presence of orthodontic anomalies is high in both fourteen and eighteen-year-olds, and fewer children of both age groups respond to regular dental checkups, an intensified prevention of oral diseases is necessary in children. Key words: Oral Health; Quality Control; Child; Adolescent; Preventive Dentistry; Dental Caries; Fluorides; Topical; Malocclusion

Sažetak
Uvod. Unapređenje kvaliteta stomatološke zdravstvene zaštite predstavlja proces čiji je cilj efikasna preventiva bolesti usta. Cilj rada je analiza efikasnosti primene preporučenih parametara kvaliteta rada u Službi za stomatološku zdravstvenu zaštitu u 2014. i 2015. godini u Domu zdravlja Zemun; uporediti decu u sedminjoj i dvanaestoj godini u pogledu postojanja svih zdravih zuba i lokalne aplikacije fluorida; odrediti prisustvo ortodontskih anomalija kod četrnaestogodišnjaka i osamnaestogodišnjaka, i ustanoviti indeks karijesa kod dvanaestogodišnjaka. Materijal i metode. Procena kvaliteta oralnog zdravlja dece u 7, 12, 14. i 18. godini života obavljana je retrospektivnom analizom podataka iz 2014. (n = 4 317) i 2015. (n = 6 575) godine. Rezultati. Značno veći procenat dece je pregledan 2015. godine (82%) nego 2014. godine (60%). Od 3 723 sedmogodišnjaka, 36,6% imalo je sve zdrave zube, a takođe 143,6% od 3 170 dvanaestogodišnjaka. Od 3 723 sedmogodišnjaka, 65,26% imalo je lokalnu aplicaciju fluorida, kao i 78,7% od 3 170 dvanaestogodišnjaka. Ortodontске anomalije su zabeležene u većem procenatu kod četrnaestogodišnjaka i osamnaestogodišnjaka tokom 2015. god. (p<0,05). Procena indeks karijesa kod dvanaestogodišnjaka godine 2014. je iznosio 1,30, a godine 1,68. Zaključak. Povećan procenat svih zdravih zuba, kao i povećan procenat lokalne aplikacije fluorida kod dvanaestogodišnjaka u odnosu na sedmogodišnjake ukazuje na to da je posećenost stomatologu redovnija kod sedmogodišnjaka, pa je i prevencija uspešnija. Visok procenat ortodontskih anomalija kod četrnaestogodišnjaka i osamnaestogodišnjaka, a značno manji broj dece obe uzraste grupe koja koji dolaze na sistematski stomatološki pregled razlozi su za intenzivniji rad na preventivi bolesti usta kod dece. Ključne reči: oralno zdravlje; kontrola kvaliteta; dete; adolescent; preventivna stomatologija; zubi karijes; topikalni fluoridi; malokluzija

Introduction

The generally accepted definition of healthcare quality, which proved to be useful in the development and formulation of strategies, regardless of the available resources, points out that the quality healthcare provides the most effective and safe prevention and treatment for healthcare users, efficiently organizing its resources, without unnecessary losses, and meeting high level demands [1]. Constant quality improvement is a continuous process aimed at achieving greater efficiency and success at work, as well as at increasing the satisfaction of customers and health care providers.

Organized efforts to assess and improve the quality of healthcare are of more recent date. In Europe, the activities to ensure quality have escalated after the adoption of the World Health Organization program, “Health for All” [2] and formulation of specific objectives pertaining to the improvement of the quality [3]. Since then, the activities and mechanisms for quality improvement have become more numerous and more diverse.

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Abbreviations

DMFT – decayed-missing-filled teeth

In accordance with the Strategy for healthcare reform [1], the Institute of Public Health of Serbia “Dr. Milan Jovanović Batut”, prepared detailed guidelines for health care institutions in terms of reporting data on work quality indicators [4, 5]. The recommended quality of work indicators for the Dental Health Care Service included the number of children aged 7 and 12 years covered by dental examination and topical application of fluoride, and the number of children with orthodontic anomalies aged 14 and 18 years.

The aim of this study was to analyze the recommended quality of work parameters for the Dental Health Care Service of the Health Center Zemun in the period 2014 and 2015; determine whether there were differences between children aged seven and twelve years with all healthy teeth and topical application of fluoride; differences between fourteen- and eighteen-year-olds in terms of untreated orthodontic anomalies, as well as to determine the caries index, and distribution of decayed-missing-filled teeth (DMFT) in twelve-year-olds in this period.

Material and Methods

This retrospective study included 7-, 12-, 14-, and 18-year-old schoolchildren having preventive check-ups at the Health Center Zemun during 2014 and 2015. The total number of examined children during 2014 and 2015 was 7,202 and 7,961, respectively. The total number of children who responded to preventive dental check-ups in 2014 and 2015, was 4,317 and 6,575, respectively.

We determined the percentage of children who responded to systematic dental examinations, the number of children with all healthy teeth, and percentage of topical application of fluoride in seven- and twelve-year-olds, as well as the caries index in 12-year-olds. The presence of orthodontic anomalies was determined in 14- and 18-year-olds. The number of participants under orthodontic treatment in 2014 and 2015 was 631 and 1,311, respectively.

Statistical data processing: frequencies and percentages were used as descriptive statistics. Differences between groups were determined by X² test. Statistical significance was defined at the level of probability of the null hypothesis of p ≤ 0.05 to p < 0.01. Statistical processing and analysis was done using SPSS ver. 20 (Statistical Package for Social Sciences).

Results

In comparison with 2014, a significantly higher percentage of children were covered by systematic dental examination (60% and 82%, respectively) during 2015 (Table 1). However, out of the total number of children who were scheduled for systematic dental check-ups during both years, 72% of children were actually examined (Table 1).

Out of 3,723 examined seven-year-olds, 1,364 (36.6%) had all healthy teeth, and out of 3,170 examined 12-year-olds, 1,385 children (43.69%) had all healthy teeth. Out of 3,723 seven-year-olds, 2,430 (65.26%) had topical application of fluoride, as well as 2,496 (78.73%) of 3,170 twelve-year-olds. There were no statistically significant differences between the data obtained in 2014 and 2015 (p > 0.05) (Graph 1).

The response of children to preventive dental examination was not satisfactory neither in 2014 nor in 2015. More orthodontic anomalies were found in fourteen- and eighteen-year-olds in 2015 than in 2014 (p < 0.05). In relation to the examined population of eighteen-year-olds, the presence of orthodontic anomalies was significantly higher (p < 0.05) in 2015 than in 2014 (Graph 2).

In 2014, there were 1,134 cases of caries, 68 extractions and 1,056 fillings in twelve-year-olds, while the total DMFT-12 was 2,258 (average DMFT-12 = 1.30). In 2015, among children of the same age, there were 1,877 cases of caries, 285 extractions, 1,430 fillings, the total DMFT-12 = 3.592, and the average DMFT-12 = 1.68. The total DMFT index was significantly higher (p < 0.05) in 2015 (Graph 3).

Discussion

Our study points to the increasing trend of dental preventive examinations in the total population of schoolchildren, indicating the introduction of a quality culture and continuous monitoring of the quality of work. However, it is evident that the number of children who respond to systematic preventive dental examinations declines with age. Dental checkups are more regular in younger children (seven-year-olds), which means that the timely prevention of caries is successful, so that the percentage of twelve-year-olds with all healthy teeth is larger. Prevention programs in most developed countries have resulted in permanent decline of tooth decay in children [6, 7], so it is necessary to revitalize the preventive health care in our country, according to recommendations, strategy and protocol already adopted [1, 8].

Table 1. The ratio of planned and completed dental examinations of schoolchildren in 2014 and 2015

<table>
<thead>
<tr>
<th>Period/Period</th>
<th>Planned number of children</th>
<th>Number of children covered by dental examination</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Planirani broj dece</td>
<td>Broj dece kod kojih je izvršen stomatološki pregled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 2014</td>
<td>7.202</td>
<td>4.317</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>2. 2015</td>
<td>7.961</td>
<td>6.575</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>3. Total/Ukupno</td>
<td>15.163</td>
<td>10.892</td>
<td>72%</td>
<td></td>
</tr>
</tbody>
</table>
The importance of topical application of concentrated fluoride is confirmed in our tests, too. The percentage of children examined follows the number of services performing topical application of fluoride. The coverage of children receiving topical concentrated fluoride is defined by the Protocol on the application of fluoride and prevention of caries in children and young people in Serbia [8]. However, the fluoride prophylaxis is not well known about in Serbia, especially in rural areas [9], which points to the necessity of promoting oral health in all, and especially in less developed countries [10–12]. Preventive fluoride agents are recommended for children who are at high risk for dental caries, although they are not profitable economically for large-scale massive application [13, 14].

The presence of untreated orthodontic anomalies is extremely high in both examined age groups. A reduced number of examined eighteen-year-olds is due to failure to respond to timely dental examination at the health center and/or visit to private dental office. It is possible that the incidence of orthodontic anomalies and caries is much higher among unscreened children of this age [15]. Such high percentage of children with untreated orthodontic problems can be reduced only by improving preventive work at an earlier age [16]; otherwise, the treatment of orthodontic anomalies is going to be more complicated and more expensive.

The ratio of caries, extracted and filled teeth in twelve-year-olds was significantly higher in 2015, but still lower than the average in Serbia, which is 2.6. The DMFT-12 index (the sum of the numbers of caries, extracted, and filled teeth in twelve-year-olds) is considered a very good indicator of oral health. Average caries index in twelve-year-olds in the European countries ranges from 0.7 to 4.2, and in most countries of the European Union, the index is between 0.5 and 1.5 [3]. In developed European countries, this index has been constantly improving since the beginning of the nineties, but in the countries of Eastern and Central Europe, it is still a public health problem. Slow improvement in these countries is attributed to the change in the health system due to political and economic changes. The economic crisis, restructuring the system of dental health care, lack of continuous implementation of health care program measures for children and youth [8], and perhaps privatization in the health care system, has led to decreased use of free health care for children [17], therefore our analysis is limited only to children who responded to medical check-ups at the public health centers.

It is of utmost importance to start the prevention of oral health as early as possible [17], in order to ensure the prevention of oral health by reliable effects [18, 19], which is defined by the dental health care quality parameters [20]. Great importance in prevention is to organize dental services and social engagement [21].

**Conclusion**

All quality indicators point to the unsatisfactory quality of oral health in children and youth examined at the Health Center Zemun. In order to improve the oral health of children, it is essential to support the adoption of healthy behaviors with regard to oral hygiene, fluoride prophylaxis, nutrition and regular visits to the dentist to control the oral health, through health and educational interventions. Improvements can be expected if the prevention programs are planned at the national level and with revitalization of preventive health care.
References