

Oral Health Status in Romani Children in Slovakia

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Abstract:

Purpose: The purpose of this monitoring was to learn about the oral health status of Romani minority in Slovakia. The children were educated in oral health, as was expected that the dental status of the children would improve with the increased level of knowledge about dental health.

Materials and methods: Romani children were regularly educated from 2010 to 2015. In 2010 and 2015 Romani children aged 5 to 14 were examined in the Spis Region, Slovakia. Dental cariosity was expressed by the DMFT (decayed, missing, filled teeth) and DMFT index for permanent and temporary teeth, respectively. Parents were asked in 2015 whether they utilize free preventive oral care for their children.

Results: In 2010, the average DMFT of all examined children

was 1.11 ± 1.45 and DMFT 6.53 ± 3.57 . In 2015, the average DMFT of all examined children was 1.81 ± 2.29 and DMFT 3.94 ± 4.19 . 12 year old children in 2015 had DMFT 2.12 ± 2.19 ; permanent teeth of 35.1% of them were intact.

In total, only 30.3% of asked parents visit dentists for preventive oral care of their children.

In the villages with a segregated Romani community only 7.1% of parents visit dentists for preventive check-up of their children whereas in the villages with integrated Romani Community it is 51.1%.

Conclusion: Conducted research showed that oral health status of Romani children in Spiš is slightly worse compared to the majority population in Slovakia. Oral health education of Romani children and their parents is necessary to meet Health21 goals in oral health in subsequent years.

Introduction

Health is one of the prime values of a human life. General human health also includes dental health. In order to achieve a high-level quality of oral health, it is important to acquire correct habits of hygiene and to enhance certain knowledge in particular areas. One of the key programs to resolve current situation is the World Health Organization (WHO) HEALTH21 project (WHO, 1999). The National Program on Care for Children and Adolescents in the Slovak Republic for the Years 2008-2015, which also includes oral health care provision aimed at reduction of cariosity and the related consequences (Public Health Authority of the Slovak Republic, 2008).

State of health of the Romani population, including oral health, is alarming. Small children have already experienced toothache. Older children suffer not only from dental caries but also from periodontic diseases. The majority of them is not familiar with basic hygiene habits and they fail to perform any preventive oral health care. It is therefore necessary to prevent the origin of diseases in early childhood in order to reduce the occurrence of consequences of insufficient oral health care.

Frankovic and his co-workers (2010) have examined mostly children of pre-school age in Slovakia, who were divided into categories of sex, demographic factors and social groups, i.e. children of majority population and Romani children. The authors have monitored occurrence of dental caries. Intensity of dental caries occurrence was expressed by the DMFT Index (decayed, missing, filled teeth). In addition they

have examined the percentage of restored teeth via RI Index (Restorative Index). Out of 471 examined children of not specified age there were 68 (14.4%) Romani children, out of which only 18 (26.5%) had their teeth intact. The results imply a statistically significant difference in occurrence of intact teeth speaking against Romani children. The intensity of dental caries in non-Romani children was DMFT 2.12, whereas in Romani children it was 5.85 (Frankovic et al., 2010).

There is a persistent social opinion that dental caries prevail among children from minority culture in comparison to children from the majority population group. Higher occurrence of dental caries among Romani children is due to lower level of awareness among their parents and almost non-existent preventive dental care by dentists (Lezovic 2012). By analyzing literary sources, we have reached the conclusion that up to now nobody has ever focused directly on research of the issue of oral health of Romani children.

The main purpose of the research was to identify the oral health status of Romani children in the Spiš region in Slovakia. The assumption was that the oral health status of Romani children is at a low level (DMFT index among 12 year old children will be higher than 1.5 - which is the value defined by the WHO Health21 for 2020 (WHO, 1999).

Secondary aims included mapping of oral health status of Romani children within individual age categories and identifying the DMFT Index.

As part of this project, the education process among Romani children took place between 2010 and 2015, instructing the children in the area of hygiene, teeth anatomy, healthy nutrition, pathogenic nature of plaque and fluoridation.

Materials and Methods

A cross-section study was performed in selected schools attended by children from Romani villages in the Spis Region, Slovakia. The research consisted of two stages: The first stage took place in 2010 and the second in 2015. The teeth of Romani children were examined by a dentist in the above mentioned time periods. Children were examined in the classrooms during school lessons with permission of their parents and teachers. Standard dental exam was performed with a mouth mirror and dental explorer at daylight. From 2010 to beginning of 2015 Romani children had 4 lessons of oral health care education per school year, they were instructed on hygiene, teeth anatomy, healthy nutrition, pathogenic nature of plaque and fluoridation.

In order to express the oral health status of permanent teeth among children international DMFT Index was used, which describes the status of permanent teeth - number of decayed, missing and filled teeth (WHO, 1987). In order to express the oral health status of temporary teeth among children, the international dmft Index was used. The proportion of children with intact teeth, especially in the population of 5 year old and 12 year old (and older) children was monitored. The age group 12 and older (12+) was also monitored for the status of the first permanent molars.

In 2015, a questionnaire created for this research was distributed to the parents. Preventive dental check-ups attendance by Romani children was followed.

Characteristics of the respondents

The pilot part of research in 2010 took place in the ghetto near the village of Rakusy. A total of 252 Romani children were involved in the study, out of which 137 (54.4%) were boys and 115 (45.6%) were girls. The children were aged from 4 to 11 years, the average age of children was 7.1 ± 1.2 years without any statistically significant difference between boys and girls (7.2 ± 1.1 and 7.1 ± 1.4 , respectively; $p = 0.570$).

In 2015, 560 Romani children were involved in the study. The children came from 3 villages in the Kezmarok district, namely Rakusy (234 children, i.e. 41.8%), Huncovce (226 children, i.e. 40.4%) and Velka Lomnica (100 children, i.e. 17.9%). The villages were chosen because the Romani communities live there in segregated ghettos. From examined children 290 (51.8%) were boys and 270 (48.2%) were girls. The children were aged from 4 to 16 years, the average age was 9.5 ± 2.8 years without any statistically significant difference between boys and girls (9.6 ± 2.9 and 9.4 ± 2.6 , respectively; $p = 0.404$).

In 2015, the questionnaire research among parents included 89 parents, out of which 42 (47.2%) were from the settlement Rakusy, 25 (28.1%) from Toporec and 22 (24.7%) from Holumnica. In the villages of Toporec and Holumnica the inhabitants of the minority population live integrated into the majority population.

Table 1 DMFT/dmft of Romani children in 2010

Age	Number of children girls / boys / total	DMFT girls / boys / total	dmft girls / boys / total
≤ 5	12 / 10 / 22	0.00 / 0.00 / 0.00	6.00 / 7.80 / 6.82
6	22 / 22 / 44	0.23 / 0.41 / 0.32	7.05 / 6.64 / 6.84
7	44 / 55 / 99	1.34 / 0.95 / 1.12	7.00 / 7.07 / 7.04
8	24 / 34 / 58	2.17 / 1.50 / 1.78	6.13 / 6.65 / 6.43
≥ 9	13 / 16 / 29	2.38 / 1.25 / 1.76	3.85 / 4.69 / 4.31
Total	115 / 137 / 252	1.28 / 0.96 / 1.11	6.37 / 6.67 / 6.53

Statistical analysis

Discrete variables were displayed in frequency tables (n/N, %). Continuous variables were summarized with descriptive statistics (N, Mean, SD). The results of the formal hypotheses were analyzed using standard methods of hypothesis testing - χ^2 -test or Fischer exact test, t-test. All testing involved two-sided tests with criteria set at $\alpha=0.05$. A p-value of <0.05 was considered statistically significant.

Results

In the pilot project in 2010, the average DMFT of all examined children was 1.11 ± 1.45 and dmft 6.53 ± 3.57 . DMFT and dmft according to age groups is displayed in Table 1. DMFT among the girls was higher than among the boys, however, not significantly (1.28 ± 1.58 and 0.96

± 1.31 , $p = 0.090$).

In the second monitoring in 2015 the average DMFT of all examined children was 1.81 ± 2.29 and dmft 3.94 ± 4.19 . DMFT and dmft according to age groups is displayed in Table 2. DMFT among the girls was higher than among the boys, however, not significantly (1.96 ± 2.35 and 1.66 ± 2.23 , $p = 0.122$).

Five year old children

DMFT among 5 year old children was 6.82 ± 5.50 and 6.55 ± 5.92 in 2010 and 2015, respectively (without any significant difference, $p = 0.862$). Intact temporary teeth were found in 18.2% and 24.2% of children in 2010 and 2015, respectively (without any significant difference, $p = 0.744$, Table 3).

Table 2 DMFT/dmft of Romani children in 2015

Age	Number of children girls / boys / total	DMFT girls / boys / total	dmft girls / boys / total
≤ 5	19 / 14 / 33	0.00 / 0.00 / 0.00	5.32 / 8.21 / 6.55
6	22 / 29 / 51	0.36 / 0.28 / 0.31	9.18 / 7.17 / 8.04
7	36 / 48 / 84	1.17 / 0.75 / 0.93	6.89 / 7.71 / 7.36
8	27 / 32 / 59	1.74 / 1.63 / 1.68	5.70 / 7.09 / 6.46
9	25 / 21 / 46	3.24 / 1.43 / 2.41	4.32 / 6.05 / 5.11
10	36 / 29 / 65	1.81 / 1.34 / 1.60	2.61 / 3.31 / 2.92
11	41 / 28 / 69	2.66 / 2.21 / 2.48	1.05 / 1.71 / 1.32
12	28 / 29 / 57	2.25 / 2.00 / 2.12	0.64 / 0.97 / 0.81
13	24 / 30 / 54	3.13 / 3.07 / 3.09	0.33 / 0.30 / 0.31
≥ 14	12 / 30 / 42	3.33 / 3.50 / 3.45	0.00 / 0.10 / 0.07
Total	270 / 290 / 560	1.96 / 1.66 / 1.81	3.61 / 4.24 / 3.94

Table 3 Five year old Romani children with intact temporary teeth

	Number of children girls / boys / total	Children with intact teeth girls / boys / total	Proportion of children with intact teeth girls / boys / total
2010	12 / 10 / 22	2 / 2 / 4	16.7% / 20.0% / 18.2%
2015	19 / 14 / 33	4 / 4 / 8	21.1% / 28.6% / 24.2%

Table 4 Romani children with intact permanent teeth in 2015

Age	Number of children girls / boys / total	Children with intact teeth girls / boys / total	Proportion of children with intact teeth girls / boys / total
12	28 / 29 / 57	10 / 10 / 20	35.7% / 34.5% / 35.1%
13	24 / 30 / 54	7 / 7 / 14	29.2% / 23.3% / 25.9%
≥ 14	12 / 30 / 42	5 / 8 / 13	41.7% / 26.7% / 31.0%

Table 5 First molars status of 12 year old and older Romani children

		Age		
Tooth		12 years (N = 57)	13 years (N = 54)	≥ 14 years (N = 42)
16	Missing	0	1 (1.9%)	0
	Radix	6 (10.5%)	8 (14.8%)	2 (4.8%)
	Filled	0	0	0
	Decay	14 (24.6%)	16 (29.6%)	8 (19.0%)
26	Missing	1 (1.8%)	0	0
	Radix	7 (12.3%)	6 (11.1%)	7 (16.7%)
	Filled	0	0	0
	Decay	11 (19.3%)	17 (31.5%)	8 (19.0%)
36	Missing	0	3 (5.6%)	1 (2.4%)
	Radix	8 (14.0%)	15 (27.8%)	15 (35.7%)
	Filled	0	0	0
	Decay	18 (31.6%)	14 (25.9%)	8 (19.0%)
46	Missing	5 (8.8%)	2 (3.7%)	5 (11.9%)
	Radix	9 (15.8%)	17 (31.5%)	10 (23.8%)
	Filled	2 (3.5%)	0	0
	Decay	13 (22.8%)	14 (25.9%)	6 (14.3%)

Table 6 Dentist visits

village			
Visit the dentist	Rakusy(N = 42)	Holumnica, Toporec(N = 47)	total(N = 89)
only in acute cases	39 (92.9%)	23 (48.9%)	62 (69.7%)
prevention	3 (7.1%)	24 (51.1%)	27 (30.3%)

Twelve year old children and older

Twelve year old children were examined only in 2015. DMFT among these children was 2.12 ± 2.19 , among the girls it was 2.25 ± 2.59 , among the boys 2.00 ± 1.75 (without any significant difference, $p = 0.673$). 20 (35.1%) children had intact teeth, 10 (35.7%) girls and 10 (34.5%) boys (without any significant difference, $p = 0.922$). The situation among older children is displayed in Table 4.

First molars status

22 (38.6%) of 12 year old children had their first molars intact; 15 (27.8%) of 13 year old and 15 (35.7%) of 14+ year old children had their first molar intact. The situation of the particular first molars among examined children is shown in Table 5. Children 12+ years of age have more often lower first molars affected, tooth 46: in 54.2% of children affected and tooth 36: in 53.6%.

Parental questionnaire

From responses to questionnaire only 27 (30.3%) of asked parents visit dentists for preventive oral care of their children. In the village Rakusy segregated Romani community only 3 (7.1%) of asked parents visit dentists for preventive check-up of their children whereas in the villages Holumnica and Toporec integrated Romani community it was 24 (51.1%) of asked parents. The monitored difference is statistically significant ($p < 0.001$) (Table 6).

Discussion

Oral health is an inseparable component of the overall human health. Caries are the most wide-spread disease among the human population. Many experts in cooperation with World Health Organization pay attention to caries prevention in children. As prevention procedures are most efficient in children thus the aim of the society is to reduce prevalence of caries among children by appropriate education. The purpose of the WHO initiative for 2000 was to achieve 50% of 5 to 6 year old children without any occurrence of caries (Federation Dentaire Internationale, 1982). Our study discovered that in 2010 only 18.2% of examined 5 year old Romani children and in 2015 24.2% of examined 5 year old Romani children had no caries. The results from

the National Health Information Centre, which collects all national data from Slovak dentists, say that in Slovakia in 2015 41.6% of 5 year old children and in year 2020 46.41% were without any caries, filling or extraction (National Health Information Center, 2016; National Health Information Center, 2021). National data collected from Presov region part of which is Spis region where our research was done showed in 2015 that 36.7% of 5 year old children had intact teeth (National Health Information Center, 2016). The aim of the WHO for 2020 is to achieve 80% of children aged 6 without caries (WHO, 1999). From results we obtained in Romani children we see obvious gap between real status of 5 year old children teeth and the aim of WHO for 2020 and even for 2000. Therefore we see necessary to make the efforts of professional community in Slovakia more efficient, so that the above goal can be achieved in the next years.

An alarming value raised from our study is dmft 8.04 found among 6 year old Romani children, which represents almost one third of all the temporary teeth. Dmft 6.55 was found among 5 year old Romani children in 2015. As a consequence of spoiled temporary teeth, permanent teeth are also endangered (Thenisch et al., 2006; Kawashita et al., 2011). Temporary teeth examination among 5 year old children in England revealed result of dmft 4.2 (Public Health England 2016). By comparing our results also to results of child examination in England in 2013 it can be stated that the children from socially handicapped families have a tendency towards higher occurrence of caries (Health and Social Care Information Center, 2015).

We found the dmft index 6.55 among 5-year-old children in 2015, which was better than in 2010, when we found the dmft index 6.82 in the same age category, but it is not statistically significant.

The tendency is good, however, there is still a long way to go, possibly also by reinforcing the existing activities. In order to ensure non-decayed permanent teeth in these children, targeted education need commence as soon as at the pre-school age and in day cares, ideally by educating parents of 1 year old children. One of the possibilities is a daily cleaning of teeth under the supervision of trained teachers.

Another purpose of the WHO initiative for

2000 was also to achieve the DMFT Index of less than 3 among 12 year old children (Federation Dentaire Internationale, 1982). The goal of the WHO for 2020 published in the Health21 program was to achieve the DMFT index among 12 old children less than 1.5 (WHO, 1999). The results of our study show that the WHO purpose for 2000 was fulfilled in examined Romani children, but not for 2020. In 2015 the DMFT Index found by us among 12 year old children was 2.12. The information from National Health Information Center for 2015 shows the DMFT Index of 12 year old children in Slovakia as 1.80 and in the Presov Region 2.09 (National Health Information Center, 2016). Our results tend to approach the average in the Region. By comparing the results of examined children from Kosovo (DMFT 2.3 of 2014), we confirm that the values are similar (Shabani et al., 2015).

The DMFT index among 12 year old children did not reach the value of 3 but sharply increased after the age of 12, without any perspective of improvement. 14 year old Romani children had the DMFT more than 3, i.e. 3.45. Apart from this, at this age the occurrence of periodontitis is higher from our experience, which was not considered in this research. Unless education at schools among children and teachers and in Romani families becomes efficient, the oral health status of Romani adolescents will only deteriorate, which would cause the deterioration of the overall health status.

Beside appropriate education of parents and children, we consider as an important factor also financial income of the families. The research of Pereira in 2007, which confirmed direct relationship between oral health status and family income and further direct relationship between oral health status and completed level of education of mothers and fathers, is supported by our results (Pereira, et al., 2007).

An interesting finding in our study was that during examinations in 2015 we found only 2 fillings of permanent first molars among 12 year old children, which confirms the finding that the Romani children parents do to use the offered dental care in Slovakia.

The study of Pilát et al. (2020) were described, revealed insufficient oral hygiene of the Roma child population. Authors of this study recommended systematic implementation of pre-

ventive examinations for oral hygiene and health programs are needed to promote oral health (Pilát et al., 2020).

We can conclude that Romani children do to use sufficiently the available dental care, but more often they seek urgent dental care in acute cases, when less invasive therapeutic procedures cannot be applied. Modern stomatology tends to use caries prevention and non-invasive therapeutic methods which can only be performed with a correctly timed early diagnostics of caries and regular dentist visits (Pavleova et al., 2015).

Our further efforts should be directed to not only symptomatic dental health care in Romani children, but rather to causal approach focused on removal of the main cause of caries origin - control of tooth plaque and correct nourishment of children (Daly et al., 2002).

Our research showed that Romani children of 12 years of age had a DMFT value lower than 3. We consider this as a positive finding, however, it does not mean that the efforts to improve

Romani children hygienic habits are not necessary.

Similarly, both our results and the results of other studies focused on the oral health of the minority Roma population, both children and adults, clearly point to the need to increase interest in this community and the need to implement education and prevention programs specifically aimed at this community (Pilát et al., 2020; Koçak et Alkaya, 2021).

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