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Research Article

Influence of socio-economic status on caries experience to schoolchildren from mining areas

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Abstract. Objective: to determine the prevalence of caries in children of school age from rural, poor mining areas, from Western Romania and to highlight the impact of socio-economic status on caries experience in school children from areas as described above. Material and Method: the mining area of Roşia Montană was established as studying area. Roşia Montană mining area is an area situated in Western part of Alba County and is consisting of Roşia Montană Commune (16 villages), Abrud town and Bucium commune (29 villages). For comparison purposes another mining area namely Băiţa Bihor was considered, which encompasses the town of Nucet, Bihor county Romania. The study was a cross-sectional one comprising of 960 subjects with ages ranging from 7 to 14 years old, selected from the schools of the above mentioned mining areas. The children were dentally examined in the schools using a dental single use kit, in order to determine the DMFT index value. Individual data of each subject were collected on the basis of prior written agreement of parents or trustees to whom we have informed on the strictly scientific purpose of the whole approach. Likewise parents and/or trustees had filled in questionnaires regarding their education and standard of living. Results: we determined the values of DMFT index varying from 0 to 16 at an average value of 5.1. We observed significant ethnical variances regarding the DMFT index vales, as these values had higher values for minority (Romani) subjects compared with majority (Romanians) subjects. We observed that subjects without caries (DMFT=0) represented 1.15% of the whole batch and they were all majority (Romanian) population. If considering the influence of income level / standard of living on DMFT index evolution, we observed a decrease in index value as the level of income is higher, for subjects from majority population (Romanian); whilst for Romani population the level of income does have a minimum influence in DMFT index value. We observed that for most of the subjects, a lower family income level had a negative impact on dental caries prevalence to subjects. Conclusions: We emphasize the family environment and its socio-economic status as indicators of oral health in schoolchildren.

Key Words: caries experience, socio-economic status, mining, Roşia Montană, rural.

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Introduction

Oral health is a crucial component of general health, because of the major impact of oral diseases on individuals, communities and society as a whole in terms of morbidity, mortality, quality of life and associated costs (Ţigăniuc et al 2011). The impact of oral diseases on individuals is reflected in their days lost at school and work, difficulty with eating, reduced self-esteem, poor quality of life, among other consequences (Lisboa et al 2013). Dental caries is the most prevalent oral disease and it remains the single most common disease of childhood that is not amenable to short-term pharmacological management (Katikireddi 2014).

Dental caries are defined as a chronic destructive process which is developing lacking typical inflammatory phenomenon, resulting into necrosis of dental tissues, infection of dental pulp and apical area and possibly determining broad repercussions (Cocârlă 2000).

Many factors influence the risk of developing dental caries, including environmental agents such as bacterial flora and fluoride exposure; behavioral factors including diet and oral hygiene; endogenous features such as tooth position and morphology, enamel composition, saliva composition and flow rate; and demographic characteristics such as age, sex, race, ethnicity, socio-economic status, parental education and access to oral health care (Shaffer et al 2012; Popoola 2013).

In developed countries, higher prevalence of dental caries was found among the children of lower social class and lower prevalence in children of high socio-economic class (Malach et al 1995). As a general trend of the last decades a decrease in caries in the heavily industrialized country was observed. The presence of caries stays at significant levels within the disadvantaged social groups and some ethnical minorities (Luca 2003).

In Romania, systematic information on the occurrence of oral diseases in children was considered in 1992 as being scarce (Petersen 1994). Some studies completed between 1986 to 1992, for children of 6 to 12 years old had shown that, for children of 7 years old, the prevalence of caries in temporary dentition was of 86%, whilst the prevalence of caries in permanent dentition was of 39%; contrariwise, the caries in permanent dentition of 12 years old children was of (Petersen 1994).

A study completed more recently in Iaşi county established a prevalence of caries of 66,7% in adults of ages ranging from 35 to 44 year old. The highest caries index was observed in adults from rural areas or presenting low incomes. The study was completed in 2007 (Senciuc 2012).

Most of the studies completed in Romania regarding oral health and the frequency of caries in school children have been

completed in large urban areas from Central and South-Eastern Romania such as Cluj Napoca, Târgu-Mureş, Iaşi, Constanţa, Bucureşti (Beresescu 2012).
Referring to Western parts of Romania, especially mountain rural and/or small urban areas, isolated from the perspective of accessibility and addressability of pediatric dental services, facing economic and social under-development, alike mining areas, information on children oral health are scarce if any.
Consequently, the objectives of current epidemiologic study are to determine the prevalence of caries in children of school age from rural, poor mining areas, from Western Romania; to highlight the impact of socio-economic status on caries experience in school children from areas as described above.

Material and method

We established the mining area of Roşia Montană as studying area. Roşia Montană mining area is an area situated in Western part of Alba County and is consisting of Roşia Montană Commune (16 villages), Abrud town and Bucium commune (29 villages). In terms of demographic and social indicators related to population within the study area, it has been observed a negative growth in population (-18.57%). This was determined by the continuous worsening of the standard of living (mainly due to massive reduction in mining employment and lack of adjective state or private investments). If comparing available data in terms of evolution of jobs occupancy, as of a socio-economic study performed by the University from Alba Iulia, the job occupancy indicators had diminished dramatically since 1990.

Table 1. Population evolution within the study area (2006-2011)

Indicator	Abrud	Bucium	Roşia Montană
Population (2006)*	5980	1739	3557
Population (2011)**	5072	1454	2656
Population growth (2011 vs 2006)	-908	-285	-901

* as of study performed by the University of Alba Iulia, 2007
** as of 2011 national census

Beside the registered unemployment, there has been a massive un-registered unemployment in the area, resulting into a serious social problem, with consequences on the quality of life, therefore affecting as well the condition of collective and individual health.
For comparison purposes it has been considered another mining area namely Baiţa Bihor, which encompasses the town of Nucet, Bihor county. The town of Nucet is the second smallest town of Romania. The town was established as result of Russian intention to exploit an uranium ore deposit located in Baiţa (few kilometers upstream). The reduction of the high concentration uranium ore after 1958 led to a drop in the Russians' interest for the area. Their departure leads to a drop of the total population to 2768 according to the 1966 census. Ever since, the town's population went on a descendent slope, reaching 2399 in 2002 (Filimon et al 2011). Currently, more than a half of the 523 employees in the town (of the 2477 total inhabitants) are occupied in the medical care sector, due to the presence of the mental illness hospital. The closing mining activities have left behind both on the ground and underground polluted brownfields (Olau et al 2012).
The study has been a cross-sectional one comprising of 960 subjects with ages ranging from 7 to 14 years old, selected from the schools of the above mentioned mining areas.
For Roşia Montană mining areas there have been visited the following schools: Secondary School „Simion Balint" from Roşia Montană (the classes from Roşia Piaţa, Roşia Sat, Gura Roşiei and Carpenis), Secondary School „Avram Iancu" from Abrud, High School „Horea, Cloşca şi Crisan" from Abrud, Secondary School from Bucium. As of Baiţa mining area, the following schools have been visited: Secondary School no. 1 from Nucet.
The children have been dentally examined in the schools using a dental single use kit (dental mirror, dental probe) and sterile gloves, using artificial light, as recommended by the World Health Organization. (World Health Organization 1997).
Inclusion criteria – children providing from mining activities impact area, children providing from family environment, children presenting mixed dentition or early permanent dentition.
Exclusion criteria – children providing non-mining areas, institutionalized children, children presenting temporary dentition and children for whom the parent/trustee written agreement could not be obtained by any reasons.
The batch was investigated considering the presence of dental caries; consequently the DMFT indexes were calculated for both permanent and mixed dentition of the subjects. In order to calculate the DMFT indexes the following denotation was used: D stands for a tooth presenting one or more caries, M stands for missing tooth as result of caries and F stands for one or more dental filing or temporary or final restoration of a tooth affected by dental caries. The calculation ignored the missing teeth as result of different causes than caries. As the age of subjects was 14 years old or younger, the molars number 3 were not present yet therefore the value of DMFT index was between from 0 to 28, as a result of computing the number of D's and M's and F's.
In order to perform the investigations in above mentioned schools, the prior approval of local authorities and schools' management was obtained. Medical data on each subject was collected on the basis of prior written agreement of parents or trustees whom we have informed on the strictly scientific purpose of the whole approach. Likewise parents and/or trustees had filled in questionnaires regarding their education and standard of living.
The batch was considered from the perspective of age distribution, gender distribution, and environment of origin distribution, ethnicity and socio-economics. The assessment of data collected was done using specific statistical testing, using MedCalc statistical program dedicated to medical research. Therefore in order to compare the mean value of one parameter corresponding to various datasets, the Kruskal-Wallis test was used; in order to correlate various qualitative and quantitative data, the Chi-square test was used; in order to determine whether two datasets differ significantly, the Kolmogorov-Smirnov test was used.
By applying all this testing we discussed then the parameters of main interest by computing the p value, which represents the level of significance of test results; then the computed p values were compared with 0.05. The result is statistical significant for p computed < 0.5.

Table 2: Correlation of unemployment rate and diminishing of mining sector

Towns	Active population		Lay-offs in mining sector	Registered unemployment as result of mining sector lay-offs
Abrud	42%	2511	746	29.70%
Bucium	43%	747	170	22.73%
Roşia Montană	39%	1387	673	48.51%

Results

Table 3. Gender distribution and statistical testing

Gender	No. of subjects	% of Total subjects
Female	442	46.04%
Male	518	53.96%
CHI square test result	5.85	
P-test value	p=0.015	

Gender distribution was tested using Chi-square test. Female subjects stand for 46.04% of the whole batch, whereas male subjects stand for 53.96% of the batch. The batch presented statistical significance as of gender distribution (p=0.015).

Table 4. Environment of origin distribution and statistical testing

Batch distribution considering the environment of origin	No. of subjects	% of Total subjects
Rural	414	43.13%
Urban	546	56.88%
CHI square test result	17.87	
P-test value	p<0.001	

The distribution as of environment of origin has resulted into the following results: subjects providing from rural area stand for 43.13% of the batch while subjects providing from urban area stand for 56.88%. Chi square test highlighted significant statistical differences (p<0.001).

Table 5. Age distribution

Batch distribution as of age groups	No. of subjects	% of Total subjects
7-9 years old	393	40.9%
10-12 years old	433	45.1%
> 12 years old	134	14.0%

By applying the Chi-square test to batch distribution by age groups dataset, resulted into Q=164.66. Computing the age groups statistical data resulted into p smaller than 0.01; as such that batch distribution by age groups is statistically significant.
From ethnical perspective, the batch consists of majority population (Romanians) and minority population (Romani). The majority population stands for 87.08% of the batch, while minority population stands for the rest of it (12.02%). Chi square test reveals significant statistical differences (p<0.001).
By applying the Chi-square test to batch distribution by ethnicity dataset, resulted into Q = 590.36. Computing the ethnicity statistical data resulted into p smaller than 0.001; as such that batch distribution by ethnicity is statistically significant.

Table 6. Ethnical distribution

Ethnicity	No. of subjects	% of Total subjects
Majority Population (Romaninas)	**836**	**87.08%**
Romani Population	**124**	**12.02%**
CHI square test result	526.58	
P-test value	P<0.001	

Table 7. Batch distribution by ethnicity and education level

	Majority	Romani	No. of subjects / %
Primary school (0-4)	0	42	42/(4.4%)
Secondary school (4-8)	45	67	112/(11.7%)
High school (8-12)	642	15	657/(68.4%)
>12 grades (university)	149	0	149/(15.5%)
	836 (87.1%)	124 (12.9%)	960

The distribution of the batch by ethnicity and level of education of subjects' parents is statistically significant. As such the majority population has a slightly higher level of education, most of the subjects' parents graduating high school (8-12 grades) (76.7% of Romanian subjects' parents standing for 97.7% of high school graduates group) or university (17.8% of Romanian subjects' parents standing for 100% of university graduates group); withal minority population has a lower level of education, as subjects' parents have graduated secondary school (54% of Romani subjects' parents standing for 59.2% of the secondary school group, 4 to 8 grades) and primary school (33.8% of Romani subjects' parents standing for 100% of the primary school group).
Out of the total batch distribution, the category with the highest representativeness is the secondary school graduates (8-12 grades, standing for 68.4% of the total batch), followed by the high school graduates (15.5% of the total batch).
By applying the Chi-square test to batch distribution by ethnicity and standard of living dataset, resulted into Q = 407.72. Computing the ethnicity and standard of living statistical data resulted into p smaller than 0.001; as such that batch distribution by ethnicity and standard of living is statistically significant.

Table 8. Batch distribution by ethnicity and standard of living

Level of income	Majority (Romanians)	Minority (Romani)	No. of subjects / %
< 500 (RON)	26	75	101/(10.5%)
500-900 (RON)	285	45	330/(34.4%)
901-1600 (RON)	320	4	324/(33.7%)
> 1601	205	0	20/(21.4%)
	836 (87.1%)	124 (12.9%)	960

There are significant statistical variances while considering the distribution of subjects by ethnicity and standard of living / level of income per family of origin. Consequently, most of Romani subjects come from families with very small and small level of income (less than 500 RON per month or 500 to 900 RON per month), while Romanian subjects come from families with higher incomes (500-900, 901-1600 or above 1600 RON per month).

Table 9. DMFT factor – statistical analyses

No. of subjects	960
Smallest DMFT value	0
Highest DMFT value	16
Arithmetic mean	5.45
95% confidence interval for the mean	5.31 to 5.59
Variance	4,85
Standard deviation	2,2
Kolmogorov-Smirnov test for normal distribution	denies normality (p<0.001)

As of Kruskal Wallis one-way analysis of ethnicity by DMFT factor in order to test whether the samples originate from the same distribution, it yields into values of K=19.60; computing the p value resulted into p<0.001, therefore the ethnicity by DMFT factor is statistically significant.

Table 10. Statistical significance of DMFT by ethnicity distribution

Factor	N	Average of ranks
(1) Majority (Romanians)	836	465.24
(2) Minority (Romani)	124	583.37

DMFT is having a higher statistical significance for Romani population if compared with Romanian population (p<0.001). As shown by chart no. 1, there is a tendency in decreasing the percentage of majority population (Romanians) as DMFT index value is increasing, whilst for minority population (Romani) the presence within the DMFT category is increasing while DMFT value is increasing.

As of Kruskal Wallis one-way analysis of standard of living / level of income by DMFT factor in order to test whether the samples originate from the same distribution, it resulted into values of K=86.02; computing the p value resulted into p<0.001, therefore the standard of living by DMFT factor is statistically significant.

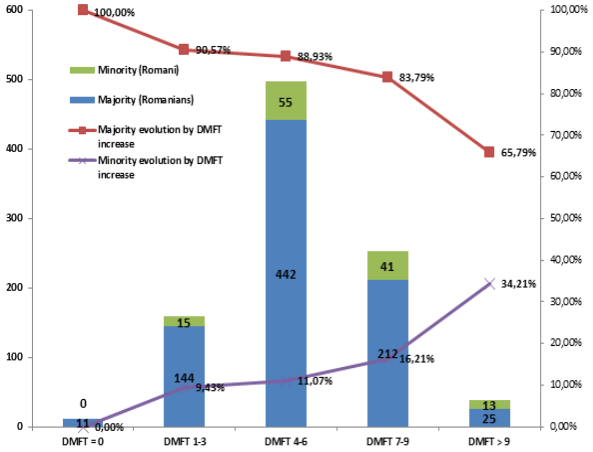

Figure 1. Ethnical distribution by DMFT category

DMFT is having a higher statistical significance for Romani population if compared with Romanian population (p<0.001). As shown by chart no. 1, there is a tendency in decreasing the percentage of majority population (Romanians) as DMFT index value is increasing, whilst for minority population (Romani) the presence within the DMFT category is increasing while DMFT value is increasing.

As of Kruskal Wallis one-way analysis of standard of living / level of income by DMFT factor in order to test whether the samples originate from the same distribution, it resulted into values of K=86.02; computing the p value resulted into p<0.001, therefore the standard of living by DMFT factor is statistically significant.

Table 11. Statistical significance of DMFT by standard of living / level of income

Level of income	No. of subjects	Average of ranks	Different (P<0.05) if considering factor no.
(1) <500 RON	101	597.07	(3)(4)
(2) 500_900 RON	330	543.79	(3)(4)
(3) 901_1600 RON	324	466.46	(1)(2)(4)
(4) >1600 RON	205	343.37	(1)(2)(3)

There are statistical variances if considering the income levels and DMFT index within the batch. Consequently, the DMFT index for "<500 RON" category is slightly different from DMFT indexes for "500-900 RON" category as well as other level of incomes. The "901-1600 RON" and ">1600 RON" are significantly different from the rest of categories.

It is obvious that for majority population, the DMFT index slightly decreases as the income level increases. For minority population, the level of income has small if any impact on DMFT index. The DMFT index for both Romanian and Romani population coming from families with low level of income are pretty much similar. When it comes to higher levels of income, the Romani are not present, while the Romanian population is having lower values of DMFT index.

By applying the Chi-square test to batch distribution by parental level of education dataset, resulted into Q=143.27. Computing

Table 12. DMFT distribution by income level for majority and minority population

Measured DMFT	Income level							
	Majority population (Romanian)				Minority population (Minority population)			
	<500 ron	500-900 ron	900-1600 ron	> 1600 ron	<500 ron	500-900 ron	900-1600 ron	> 1600 ron
DMFT= 0	0	1	3	7	0	0	0	0
DMFT 1-3	2	30	52	54	7	8	0	0
DMFT 4-6	11	144	191	103	38	15	2	0
DMFT 7-9	13	95	65	39	25	14	2	0
DMFT > 9	0	15	9	2	5	8	0	0

the parental level of education statistical data resulted into p smaller than 0.001; as such that batch distribution by parental level of education is statistically significant.

It is obvious that for majority population, the DMFT index slightly decreases as the income level increases. For minority population, the level of income has small if any impact on DMFT index. The DMFT index for both Romanian and Romani population coming from families with low level of income are pretty much similar. When it comes to higher levels of income, the Romani are not present, while the Romanian population is having lower values of DMFT index.

By applying the Chi-square test to batch distribution by parental level of education dataset, resulted into Q=143.27. Computing the parental level of education statistical data resulted into P smaller than 0.001; as such that batch distribution by parental level of education is statistically significant.

Table 13. Statistical significance of DMFT by parental level of education

Factor	No. of subjects	Ranks average	Diffrent (P<0.05) if considering factor no.
primary school (0-4)	42	679.26	(3)(4)
secondary school (4-8)	112	620.23	(3)(4)
high school (8-12)	657	493.34	(1)(2)(4)
>12 grades (university)	149	262.82	(1)(2)(3)

There are significant variances in terms of DMFT index by parental level of education. Thus DMFT index for subjects with parents having lower education (less than 4 primary grades) is significantly different then DMFT index for subjects with higher parental level of education, such as high school graduates or university/similar graduates, but not that different from secondary school graduates (84 to 8 grades). Subjects with high school parental education or university/similar education are slightly different to each other as well.

DMFT is decreasing as the parental level of education is decreasing, for both Romanian and Romani subjects. There are insignificant variances of DMFT index value between majority and minority subjects for similar level of education category.

By applying the Chi-square test to batch distribution by DMFT and age groups dataset, resulted into Q = 24.64. Computing statistical data resulted into p smaller than 0.001; as such that DMFT distribution by age groups within the batch is statistically significant.

DMFT assessment for the whole batch as of age groups reveals significant statistical variances between all age groups ($p<0.05$).

For batch distribution by DMFT category, it is observed that the group of DMFT = 0 has 11 subjects, standing for 1.15% of the batch, while most of the subjects (497) are registered within the DMFT 4-6, standing for 52.5% of the batch.

For DMFT distribution by localities of origin, it is observed that most of the subjects with DMFT =0 are from Roşia Montană (6), followed by Nucet (3). Same is for DMFT index values of 1 to 3.

For DMFT index mean distribution by localities of origin of subjects, it resulted into the following results: mean DMFT for Roşia Montană is 5.75, mean DMFT for Abrud is 5.54, mean DMFT for Bucium is 4.78 and mean DMFT for Nucet is 4.46.

For mean DMFT, it is observed that the highest value (5.75) has been established for Roşia Montană, while the lower value (4.46) has been established for Nucet.

Discussion

Some authors consider that the descriptive, cross-sectional studies aim to gather the necessary information, the description of the state of health of a community, using the data which are commonly available or data obtained within a special investigation (Chirila et al 2014).

Both areas (Roşia Montană and Baiţa) are mining areas facing increasingly unemployment and lack of job opportunities as the mining sector has downsized. This is having significant consequences in standard of living, which is having repercussions on oral health as well on caries experience revealed by DMFT index. There have been measured DMFT index values varying from 0 to 16, with a mean DMFT index value of 5.1 for the studied batch. We observed significant statistical variances by ethnicity with regard to DMFT index values, as these values tend to be higher in minority population versus majority population. Out of the group presenting "0" value for DMFT index, which is standing for only 1.15% of the whole batch, there is not a single subject of minority (Romani) ethnicity.

As of mean DMFT values, we observed that the smallest values was found in population from Nucet, Băiţa mining area, followed by Bucium, Roşia Montană. Therefore the best carious experience was found in populations with fewer subjects.

Table 14. DMFT distribution by parental level of education for majority and minority population

Measured DMF	Level of parental education							
	Majority population (Romanian)				Minority population (Romani)			
	primary school (0-4)	secondary school (4-8)	high school (8-12)	>12 grades (university)	primary school (0-4)	secondary school (4-8)	high school (8-12)	>12 grades (university)
DMFT = 0	0	0	3	8	0	0	0	0
DMFT 1-3	0	1	82	55	4	9	2	0
DMFT 4-6	0	12	366	71	12	34	9	0
DMFT 7-9	0	25	174	13	18	19	4	0
DMFT > 9	0	6	18	2	8	5	0	0

Table 15. Statistical significance of DMFT distribution by age groups

Factor	No. of subjects	Ranks average	Different ($p<0.05$) if considering factor no.
(1) 7-9 yo	393	528,4	(2)(3)
(2) 10-12 yo	433	461,47	(1)(3)
(3) > 12 yo	134	401,5	(1)(2)

Table 16. DMFT distribution by group ages and ethnicity

DMFT	Majority			Minority		
	7-9 yo	10-12 yo	> 12 yo	7-9 yo	10-12 yo	> 12 yo
DMFT = 0	3	5	3	0	0	0
DMFT 1-3	37	74	27	3	6	6
DMFT 4-6	185	207	57	18	19	18
DMFT 7-9	108	97	7	19	16	6
DMFT > 9	15	5	6	5	4	4

Table 17. DMFT distribution by number of subjects

Measured DMFT	No. of subjects	% of batch
DMFT = 0	11	1.15%
DMFT 1-3	159	15.94%
DMFT 4-6	497	52.50%
DMFT 7-9	253	26.35%
DMFT > 9	38	4.06%

Table 18. DMFT distribution by number of subjects and localities of origin

Measured DMFT	Roşia Montană	Abrud	Bucium	Nucet
DMFT = 0	6	1	1	3
DMFT 1-3	66	32	18	37
DMFT 4-6	158	272	19	55
DMFT 7-9	106	128	8	11
DMFT > 9	28	0	4	7

Similar studies from Europe revealed significant lower values for DMFT index. Thus for Holland, the DMFT index value is 1.1 and there is a decreasing tendency in DMFT index value at children from average or high income level families (Truin et al 1998). Another study completed in Eastern Europe revealed DMF indexes values of 2.7 in Czech Republic and 5.1 in Poland (Kunzel 1996).

As stated by the statistical information provided by the WHO, based on studies completed during 1980 to 2009, there is a slight tendency in decreasing of caries prevalence in 12 years old children. Consequently, Romania had an average 2.8 DMFT index value in 2000, compared with 3.1 DMFT index value measured in 1986. For the studied batch, the average DMFT index is 5.1, which is almost twice the value of national DMFT index (Analiza de situaţie în Romania ocazionată de celebrarea Zilei Mondiale a Să nătăţii Orale).

In 2007 a study of a representative sample of 259 children aged 12 years from Constanta County registered a DMFT index value

of 3.15. Another study completed in Bucharest in 2009 on a batch of subjects aging 11 to 13 years old revealed a DMFT value of 2.8. A study completed in Targu Mures in 2011 highlighted DMFT index values of 0.94 for children aged 7 years and 3.42 for children aged 9 years (Beresescu et al., 2012).

By comparing the average DMFT value of 5.1 for the batch subject to the current study, it is obviously higher than the data available. One possible explanation is the lack of education of parents, which has been observed in correlation of DMFT index value with both parental level of education (and ethnicity); it has been observed a decrease of DMFT index value as the parental education is higher. If considering the influence of income level / standard of living on DMFT index evolution, it has been observed a decrease in index value as the level of income is higher, for majority population; whilst for Romani population the level of income does have a minimum influence in DMFT index value. We may observe that for most of the subjects, a lower family income level has a negative impact on dental caries prevalence to schoolchildren.

Several researchers have stated that a lower educational attainment was strongly associated with higher probability of all types of oral health problems and that, in childhood, oral health may indirectly influence racial and socioeconomic disparities in other forms of health (Kim et al 2013). In addition, individuals in poor socioeconomic situations suffer from psychological and social problems because of living in poverty, influencing the way parents care for their children (Blackburn at al 1991).

Conclusions

In rural mining areas presenting low socio-economic standard, the mean DMFT value is significantly higher than in other studied areas from Romania and double the value of the European DMFT mean value.

There are ethnical differences in terms of family of origin's standard of living and parental education level for subjects from studied mining areas.

We believe that the socio-economic disparities have a significant influence on oral health status, consequently impacting the caries presence; it has been observed that a lower family income level has a negative impact on dental caries prevalence to schoolchildren.

Education is a main factor correlated to the oro-dental status; therefore we may say that a lower parental educational attainment has been strongly associated with a negative caries experience. We emphasize the family environment and its socio-economic status as indicators of oral health in schoolchildren.

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