

Caries experience among preschool children from two areas in Romania

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Summary

Aim: Previous studies have shown differences between urban and rural areas concerning dental health. Our purpose was to compare caries experience among preschool children from two areas in Romania: an urban area and a rural one. **Material and methods:** A cross-sectional study was conducted upon 235 children aged between 3 and 7 years - 129 from an urban area (mean age 5.43 ± 0.18 years) and 106 from a rural area (mean age 5.90 ± 0.20 years). Examination was performed according to the WHO criteria (1987). Mean values and confidence intervals were calculated for caries prevalence (Ip), dmft/s indices and their components for the entire sample and for the 5-year-old subjects using Microsoft Excel ($t=1.96$). Statistical significance of differences between the two areas was assessed by using the t-Student test ($p=0.05$). **Results:** 1) For the entire sample: a) in the urban area $Ip=72.87\% \pm 4.23\%$; $dmft=4.18 \pm 0.72$; $dmfs=8.20 \pm 1.87$; in the rural area $Ip=92.46\% \pm 2.90\%$; $dmft=7.03 \pm 0.83$; $dmfs=14.69 \pm 2.30$. 2) For the 5-year-olds: a) in the urban area $Ip=64.81\%$; $dmft=3.78$; $dmfs=6.72$; b) in the rural area $Ip=91.30\%$; $dmft=7.48$; $dmfs=13.83$. **Conclusions:** 1) There were differences in caries prevalence and caries experience between the two areas. 2) Ip and dmfs indices were significantly higher in the RA. 3) In the rural area Ip in boys is significantly higher than in girls. 4) More than half of the subjects in the rural area need complex dental treatment ($ds>10$).

Key words: Romania, prevalence index and caries experience, preschool children, urban, rural.

Introduction

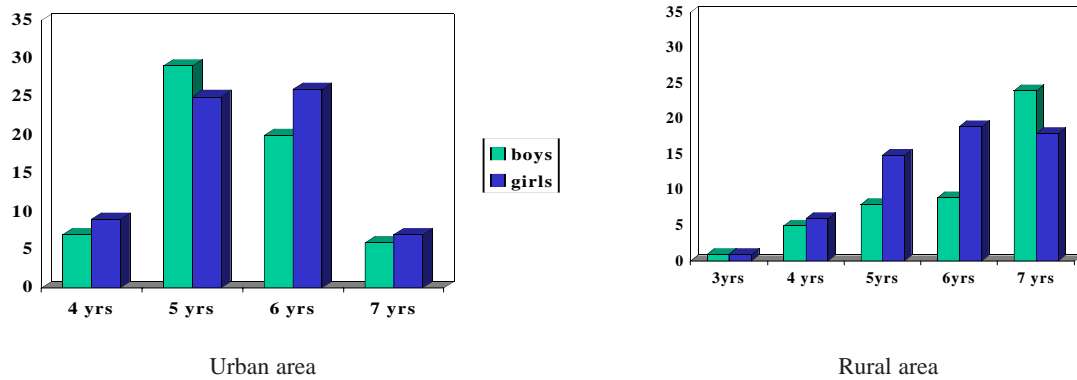
At the moment, literature worldwide provides less data on caries experience in preschool children than in schoolchildren. The main reason for this situation is probably the more difficult approach, especially for those preschool children who are not included in communities (such as kindergartens). The existing studies report differences in caries experience between children living in urban areas and children living in rural areas and also between the two sexes. However, data are contradictory. On one hand, there are studies that show higher carious involvement in children living in rural areas compared to those who live in cities [1-3]. On the contrary, other authors report higher caries prevalence in children from urban areas [4]. Some studies indicate higher caries prevalence and experience in boys [1], whilst others do not find statistically significant differences between sexes [3,5,6]. Given

these contradictions, as well as the fact that in Romania there are few data on dental health of preschool children after 1990 [7, 8], our aim was to determine and compare caries experience of two groups of preschool children in two different areas of the country (urban and rural).

Material and methods

A cross-sectional study was conducted in the year 2000 upon two groups of preschool children aged between 3 and 7 years. The first group consisted of 129 children (mean age 5.43 ± 0.14 years) from a kindergarten in Bucharest, capital of Romania, situated in a field area. The second group consisted of 106 children (mean age 5.90 ± 0.20 years) from 3 kindergartens in a rural area - district of Buzau, situated in a hilly region. Age and sex distribution of the children in the two groups are shown in *Figure 1*.

Figure 1. Age and sex distribution of subjects



In both areas fluoride concentration in drinking water is below cario-protective level. The subjects were examined in kindergarten by two dentists, in natural light, using the regular instruments (dental probe and mirror) and observing the WHO recommendations (1987) [9]. A clinical record containing the date of examination, patient's personal data and dental status were performed for each subject. Mean

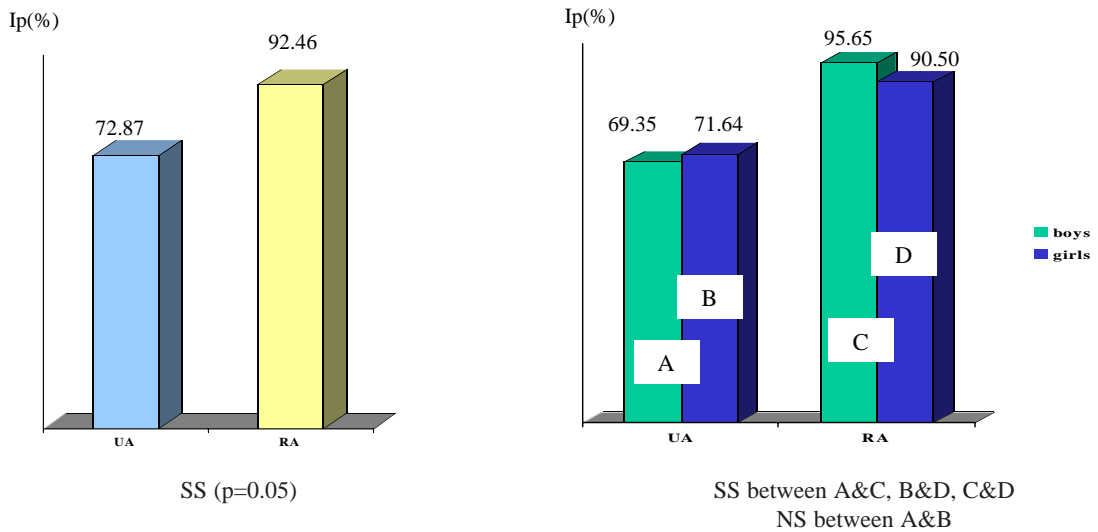
values and confidence intervals ($t=1.96$) for caries prevalence (I_p), dmft/s indices and their components (d,m,f) were calculated both for the entire sample and for the 5-year-old subjects. Data analysis was performed using Windows Excel and Access softwares. Statistical significance of differences between the two areas (urban and rural) was assessed by using the t-Student test ($p=0.05$).

Results

1) For the entire sample

a) Caries prevalence. Prevalence index (I_p) and sex distribution of I_p are given in Figure 2.

Figure 2. a) Caries prevalence index (I_p). b) Sex distribution of I_p . (SS=statistically significant; NS=non-statistically significant)

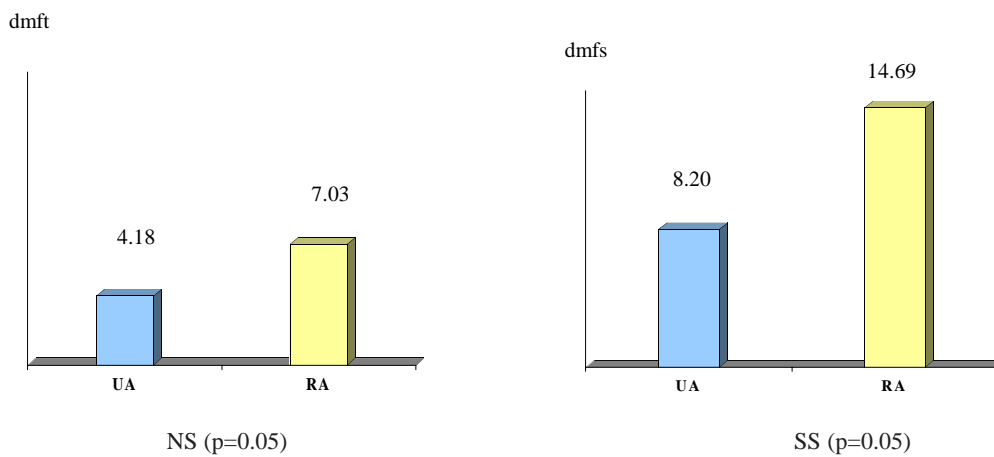


Ip is $72.87 \pm 4.23\%$ for the urban area (UA) and $92.46 \pm 2.90\%$ for the rural one (RA).

Sex distribution of Ip shows statistically significant lower values for the UA. Thus, Ip in girls is 71.64% in UA and 90.50% in RA. In boys, Ip is 69.35% in UA and 95.65% in RA. Although Ip in UA is higher in girls than in boys, the difference is not statistically significant. In exchange, boys in RA have a statistically significant higher Ip than girls in the same group.

b) Caries experience. Caries experience was evaluated by calculating mean values of dmft and dmfs for both groups. In UA dmft is 4.18 ± 0.78 and dmfs is 8.20 ± 1.87 . In RA dmft is 7.03 ± 0.83 and dmfs is 14.69 ± 2.30 (Figure 3).

Figure 3. Caries experience indices for the entire sample



Although both indices have different values for the two areas, differences are statistically significant (SS) only for dmfs, which is higher in the RA.

Caries experience indices and their components for the two areas are given in Table 1.

Table 1. Caries experience indices and their components for entire sample (confidence interval of mean values in brackets)

Areas	Caries index							
	dt	mt	ft	dmft	ds	ms	fs	dmfs
Urban	4.12 [0.72]	0.00 [0.00]	0.06 [0.06]	4.18 [0.72]	8.10 [1.84]	0.00 [0.00]	0.10 [0.13]	8.20 [1.86]
Rural	6.94 [1.30]	0.08 [0.06]	0.00 [0.00]	7.03 [1.32]	14.24 [2.68]	0.45 [0.45]	0.00 [0.00]	14.69 [2.77]

Figures show that caries experience indices are mostly given by their "d" components in both areas.

The subjects' distribution by number of decayed tooth surfaces was done in order to assess the degree of carious involvement (Table 2).

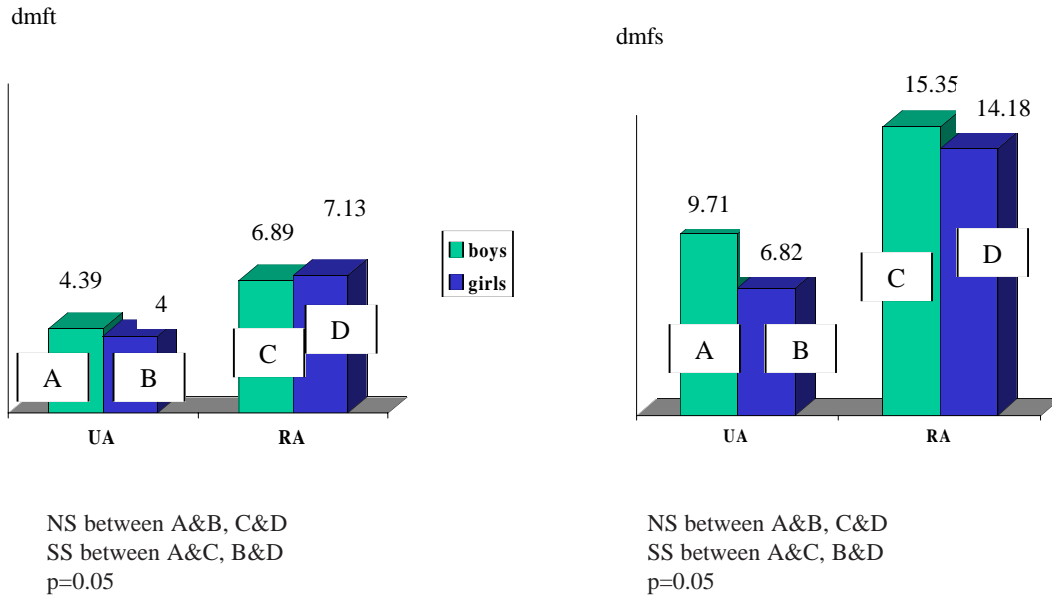
Table 2. Subjects' distribution by number of decayed surfaces (% of total number of subjects)

ds	Urban area (%)	Rural area (%)
0	31.01	7.54
1-5	24.03	17.92
6-10	17.05	16.98
>10	27.13	57.55

It can be seen that 31.01% of the children in UA and 31.01% of the ones in RA are caries free. More than half of the children in RA have more than 10 decayed dental surfaces and therefore need complex dental treatment. Differences of

dmft/s indices between sexes in children of the same area are not statistically significant, but caries experience is higher for boys and girls in RA (Figure 4).

Figure 4. Sex distribution of caries experience indices for the entire sample



2) For the 5-year olds

Ip and dmft/s values are given in Figure 5 and Table 3 respectively and show statistically sig-

nificant differences between the two areas for all indices (higher values in RA).

Figure 5. Caries experience of the 5-years-old children of the entire sample

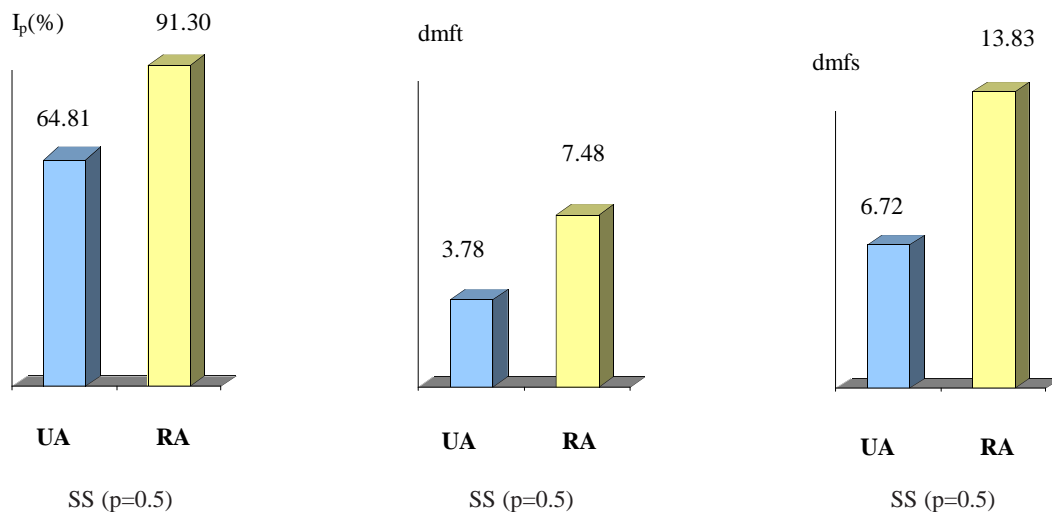


Table 3. Caries experience indices and their components in 5-years-old subjects (confidence interval of mean values in brackets)

Areas	Caries index							
	dt	mt	ft	dmft	ds	ms	fs	dmfs
Urban	3.78 [1.07]	0.00 [0.00]	0.00 [0.00]	3.78 [1.07]	6.72 [2.44]	0.00 [0.00]	0.00 [0.00]	6.72 [2.44]
Rural	7.35 [3.00]	0.13 [0.05]	0.00 [0.00]	7.48 [3.05]	13.00 [5.31]	0.83 [0.33]	0.00 [0.00]	13.83 [5.65]

The reason why sex distribution of caries experience was not done is that the number of 5 year-old children in the RA sample was not large enough to avoid errors.

Discussion

The results show differences in carious involvement level between preschool children in the two areas. *Caries prevalence* is high for both groups, but *Ip* is, statistically, significantly higher in RA ($p=0.05$). The higher values we found for *Ip* in RA are consistent with the results reported by Hescot and Roland (1994), Piper and al. (1999), Szöke and Petersen (2000). As concerns sex distribution of *Ip*, the situation is different for the two areas: in UA *Ip* is slightly higher in girls than in boys (non-statistically significant), whilst in RA boys are significantly more affected by tooth decay ($p=0.05$). In this respect, our results are only in part consistent with the ones reported by other authors [1, 3, 5, 6].

Caries experience indices have higher values in RA compared to UA, but differences are statistically significant only for *dmfs* ($p=0.05$). In both areas *dmft/s* indices are mostly given by the "dt" (decayed tooth) and respectively "ds" (decayed

surface) components. The same finding is also reported by most of the studies on caries experience conducted in the EU countries, as well as in other parts of the world [5, 6, 10-12]. Values for the "f" components (filled teeth/surfaces) are very low: $ft=0.06$, $fs=0.12$ for UA and $ft=0$, $fs=0$ for RA, showing little concern of the families for having their children's teeth treated and a low level of dental health education. Sex distribution of caries experience indices show non-statistically significant differences between sexes in both areas.

Carious involvement is severe in both areas: about 1/4 of the subjects in UA and more than half of those in RA have more than 10 decayed dental surfaces, whilst only 1/3 of the children in UA and 1/10 of the ones in RA have sound dentition. The low number of caries free children in both groups, but especially in the RA group, point out the need for applying systematic preventive means beginning with very early ages.

The values we found for *Ip* and *dmft/s* indices are relatively high as compared to the ones reported for countries where preventive programs have been implemented and applied for a long time [10].

Table 4 compares the *Ip* and *dmft/s* values we obtained in the present study for the 5 years old subjects to previous data in literature.

Table 4. Literature data on caries prevalence and caries experience in 5 years old children

Authors	Year	Country-Area	Ip (%)	dmft	dmfs
Dohnke - Hohrmann Sylvia [13]	1994	Germany - Urban	62.50	2.99	6.06
Campus G., Lumbau A., Falcolini G. [14]	1998	Italy - Urban	52.00	2.81	7.22
Present Study	2000	Romania - Urban	64.81	3.78	6.72
Schwartz E., Lo Ecm, Wong Ekl, Tong A. [15]	1993	China - Rural	93.00	-	15.00
Saenz Laura, Sanchez Leonor [16]	1997	Mexico - Rural	75.00	4.08	-
Present Study	2000	Romania - Rural	91.30	7.48	13.83

Comparing our data for the 5 years olds sample to similar previous studies conducted in former socialist countries, our results are close to the ones

reported in Hungary for 5-6 years old children. Thus, Szöke and Petersen (2000) report for the city of Budapest an *Ip* of 64% and a percentage

of 36% caries free subjects. For rural areas, the same authors report percentages of caries free children varying from 4% (Tét) to 36% (Bóly) [3].

The results of the present study are due both to the lack of a national program for monitoring dental health of preschool children and to the relatively low parents' concern about the dental health of their own children, who are most commonly brought to the dentist's only in emergency situations. The higher caries involvement in the rural area can be explained by the fact that for these children the access to both media education means and dental care is more difficult than for those living in urban areas.

Conclusions

The present study points out differences in caries prevalence and caries experience between

the two areas taken into account (rural and urban). Ip and dmfs indices are significantly higher in the rural area. In the rural area, Ip in boys is significantly higher than in girls. More than half of the subjects in the rural area and about ¼ of the ones in the urban area need complex dental treatment (ds>10). These findings stress the need for national as well as regional dental health education programs involving both children and their caretakers. Kindergarten and primary school have great potential for influencing oral health behavior of children. Therefore, community-based oral health promotion programs are likely to be effective in improving dental health in preschool children from both rural and urban areas, provided that they are designed to take into account, beside dental reasons, both socio-economic and cultural factors.

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