Socio-economic status and caries experience in primary teeth among schoolchildren of 1-st grade in Bucharest

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Abstract:
There are large disparities in oral health between the poor and wealth people. Caries disease process involves host, environment and agent variables. The objective of the paper is to analyze the relationship between socio-economic status (SES) and dental caries in primary teeth among schoolchildren in Bucharest. Method: the cross-sectional survey included 510 children aged 6 years, which were examined and interviewed according with WHO criteria. Results: there is evidence for an inverse relationship between SES and the caries experience in deciduous dentition among studied schoolchildren: as socio-economic status increase, disease and its impacts decrease. Conclusions: low SES may serve as a marker for increased risk caries; schoolchildren of lower SES must benefit from more frequent and intensive preventive services, education and health promotion activities.

Key-words: caries experience, primary teeth, socio-economic status

Introduction

Despite marked improvements over the past century, oral health is a significant problem: caries is the most common chronic disease of childhood [1]. The disease has it roots in a complex chain of socio-economic determinants. A few studies of socio-economic status and dental caries experience had been realised, especially in developing countries, in recent years [2].

In the World Health Report 2002, the World Health Organization analyzed the evidence on selected risks to health and the burden of disease; the existence of a social gradient in dental caries prevalence was found as measured by the association in dental caries indicators and socio-economic status [2].

The recent health research has focused on describing medical and non-medical determinants of health. American Academy of Pediatrics [1] published online, in 2007 a conceptual model derived from population health and epidemiology fields, which have moved toward multilevel, holistic approaches to analyse the complex and interactive causes of children's health problems. This model incoporates the 5 key domains of determinants of health: genetic and biological factors, the social environment, the physical environment, health behaviors and dental and medical care. The last, the model includes the aspect of time, recognizing the evolution of oral health disease (eg, caries) and influences on the child-host over time. Families provide support and role modeling to children, influencing children oral health both directly and indirectly. Parent's education and income impact their children's status. Income works both at the family and community levels in influencing health, directly and indirectly.

There is evidence of powerful links between the individual socio-economic experience for disadvantaged children and adverse health events [1]. Children borned in low-income families are more likely to have low bith weights which impacts oral health ; they also have more difficulty in school; poor oral health can increase school absence.

Socio-economic status can further influence health literacy, which, in turn, affects health.

The WHO Global Oral Health Programme is involved with risk factors analysis as part of its initiative to strength oral health promotion and disease

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prevention and to integrate oral health into national health programmes.

Material and method

This cross-sectional study was conducted in dental offices within schools in Bucharest, during 2005-2007. Following written informed consent of parents, 510 urban schoolchildren (52.9% female, 47.1% male) aged 6 and 7 years were clinical examined according with WHO criteria. Schoolchildren were randomly selected from12 schools in Bucharest, with different socio-economic backgrounds.

Collected data were:

- general data of every child (name, age and gender)

- deciduous caries experience

- periodontal status

- index of Orthodontic Treatment Needs (IOTN)

- oral hygiene (visible dental plaque index)

- socio-economic status of the family: occupation of the parents (according with the arborescent structure of occupation classification in Romania), the income and birth order (e.g. parenting skills improve with later children but with more demands on parent's time [1]).

The scale used for socioeconomic status (SES) is:

- low (SES 1)

- moderate (SES 2)

- high (SES 3)

Results

This cross-sectional study revealed some correlation between:

- oral health and socio-economic status for primary teeth;

- indicators of prevalence and intensity for dental caries in accordance with socio-economic status.

The prevalence of caries, and indicators of intensity and gravity of caries are significantly associated with caries experience, as is shown in *Table 1*.

The prevalence for schoolchildren *(Fig.1)* from families with low socio-economic status (SES 1) was 85.1% and 56.7% for those with high socio-economic status (SES 3).
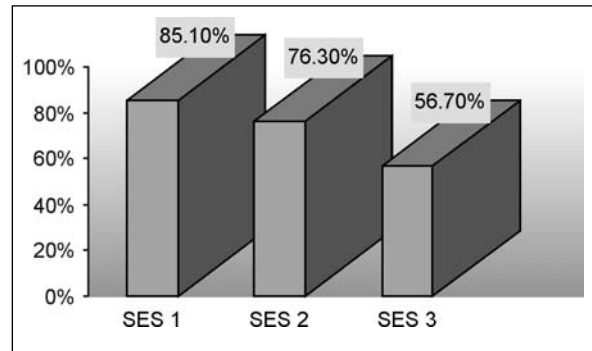

Fig. 1. Prevalence of caries according with SES

Maximum value (552.7%) for caries intensity is for schoolchildren with lower SES and minimum (300%) for higher SES (similar results for Gravity Index, for the three socio-economic segments, as shown in *Fig. 2).*
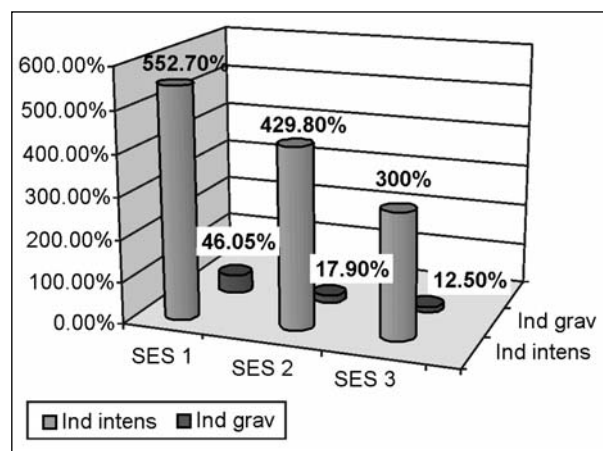

Fig.2. Intensity and gravity caries indicators according with SES

In *Table 2* are shown decayed (d-s) and filled (f-s) scores for schoolchildren aged 6 years: the great values of d-s scores are for children with SES 1 and there is a direct correlation between f-s score and SES.

Table 1. Caries indicators according with SES

Indicators	SES1	SES2	SES 3
Prevalence	85,1%	76,3%	56,7%
Intensity index	552,7%	429,8%	300%
Gravity index	46,05%	17,9%	12,5%

Table 2. Index d-s and f-s scores according with SES

d-s	SES 1	SES 2	SES 3
	8,17(10,25)	5,24(6,26)	4(6,93)
f-s	SES 1	SES 2	SES 3
	0,78	0,53	3,43

The record of decayed teeth and filled teeth *(Fig.3)* shows that value of ds/fs rapport increase for SES 1 comparatively with those with SES 3, wich means that treatment needs are more important for schoolchildren with moderate and low socio-economic status.
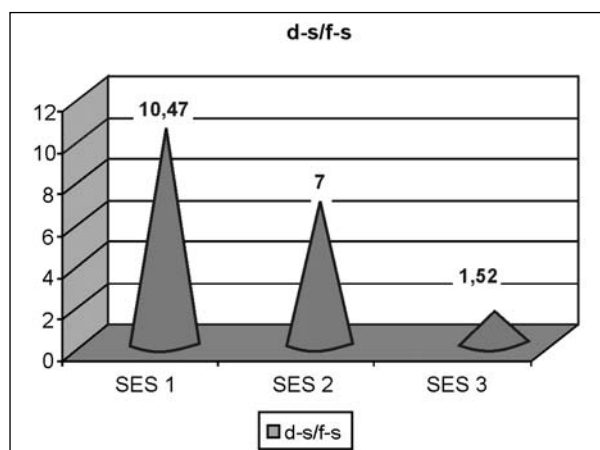

Fig.3. Rapport d-s/f-s according with SES

The Pearson bivariate correlation shows a significant link between socio-economic status and def-s index *(Table 3)*. The test is significant statistic and the negative value of Pearson (r) shows an inverse correlation: as socio-economic status decrease, caries index increase.

Table 3. Pearson correlation between def-s and SES

		SES	def-s
Status socio-economic	Pearson Correlation	1,000	**r=-0,220****
	Sig. (2-tailed)	,	0,000
	N	923	625
def-s	Pearson Correlation	-,220**0	1,00
	Sig. (2-tailed)	0,000	,
	N	625	625

** Significat correlation for p< 0.01 (two-tailed).

For children with low socio-economic status (SES 1) value of def-s index is 11.53, for those with SES 2, def-s is 8.17 and 5.41 for high SES *(Table 4)*. Percentage of caries-free children is 38.8% for SES 3, comparatively with moderate and low socioeconomic status: 19.1%, respective 6.9%.

Table 4. Def-s scores according with SES

	SES 1	SES 2	SES 3
defs=0	6,90%	19,10%	38,80%
defs= 1	-417,20%	18,10%	25,20%
defs=5	-822,10%	21,30%	13%
defs=9	-1420,70%	24,50%	7%
defs>14	33,10%	17,00%	15,80%

ANOVA test *(Tabel 5)* shows that socio-economic status is a factor which significantly influence def-s index ($p < 0,01$).

Discussions

Socio-economic status (SES) is generally measured by indicators of human capital (income, education or occupational prestige) that offer avantages to individuals [3]. As regards the income, in our study, there were some reticences from parents offering this kind of information.

There is a growing accomplishment of the need to commence prevention from a young age and to examine the effect of early intervention in childhood on general and dental health with both population and high risk approaches [4]. Over the past decades, a large number of research reports show that dental caries is linked to social factors [2]. As for general health, social inequality in oral health appears to be universal, even in countries with a long tradition of oral health promotion, preventive oral care and dental health services.

Factors influencing health are expressed at the individual, family and community levels. Including social and psychological variables improved prediction over solely biological variables. The strength of the association between social class and caries experience was twice that of the association between tooth

Table 5. ANOVA test between def-s and SES

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2031,409	1	2031,409	31,693	,000
	Residual	39932,591	623	64,097		
Total	41964,000	624				

a Predictors: (Constant), Socioeconomic status
b Dependent Variable: defs

brushing and caries and nearly three times that between sugar confectionery and caries [5].

Health disparities are generally recognised, but questions remain about the mechanisms that account for differences in oral health status as related to socio-economic status associated with dental caries experience. Foccussing on risk to health is the key to preventing disease and risk factor assessment measure the potential of prevention. The healthiest population are in prosperous communities and societies with the least income inequality [1].

Conclusions

There is strong evidence that socio-economic status significantly influences children oral health.

That is why, socio-economic status could be considered as a risk factor for dental caries development among children.

Further studies, conducted in different countries, on different social groups, but using standardized data collection will help in understanding how socio-economic background help determine which young children develop dental caries.

The study of children's oral health from a global perspective remains largely in its infancy and is poised for additional development.

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