International Journal of Research in Health and Allied Sciences

Journal home page: www.ijrhas.com

Official Publication of "Society for Scientific Research and Studies" [Regd.]

ISSN: 2455-7803

Original Research

Caries prevalence of 5, 12 and 15-year-old children: A survey study

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ABSTRACT:

Aim: To study the caries prevalence and caries experience of 5, 12 and 15-year-old children and evaluate how the disease pattern is related to their sociodemographic parameters. **Methods:** A stratified cluster sample of 1200, 800 and 700 of five, twelve and fifteen-year-old children were randomly selected according to WHO guidelines for surveys and examined for dental caries, according to the BASCD criteria and standards. d3mft, D3MFT and their components, as well as d3mfs, D3MFS, Care Index (CI) and SiC were recorded and related to the demographic data collected concerning age, gender, counties, urban/rural areas and parents' educational status. **Results:** Dental caries varied considerably between the different districts, with a mean dmft/DMFT value for each age group being 1.77, 2.05 and 3.19 respectively, while 64%, 37% and 29% of them, were with no obvious dentinal caries. Children living in rural areas demonstrated significantly higher dmft/DMFT values and less dental restorative care (CI), whereas children with fathers of a higher educational level showed significantly lower dmft/DMFT values. The significant caries (SiC) index value for the three age groups was 5.01, 4.83 and 7.07 respectively. **Conclusions:** Despite the decrease in the prevalence of caries in children disparities remain. Children in rural areas and children with less educated parents had more caries and more untreated caries. All the above call for immediate intervention with comprehensive preventive programs and better geographic targeting of the dental services at a national level including targeted prevention of pit and fissure sealants on posterior permanent molars.

Key words: caries prevalence, caries experience, national survey, adolescents

Received: 27 October, 2021 Accepted: 30 November, 2021

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This article may be cited as: Mursaleen H. Caries prevalence of 5, 12 and 15-year-old children: A survey study. Int J Res Health Allied Sci 2022; 8(1):39-42.

INTRODUCTION

The presence of dental caries declined among children globally between 1970 and 1990.[1-3] The dental health of adolescents in their mid-teens is threatened when recently erupted permanent teeth exist together with simultaneously exfoliating carious primary teeth. A microbe reservoir of the primary teeth may put general health status at risk. Carious primary teeth may also risk the health of later permanent teeth.[4,5]

Even a small amount of caries must be carefully considered because of the indication of transmission of bacteria. Caries, an intensive infection disease that has to be dealt with, leads to emergency room visits, increased costs, and time, and, in addition, diminished oral-related quality of life.[6] Despite annual check-ups, caries continues to occupy the newly erupted teeth of adolescents. It is now well known that risk factors such as poor diet, poor oral hygiene habits, parents' young age, parents' insufficient competence in child rearing, and previous caries are all associated with caries in childhood,[7-10] and discussion of those issues ought to take place during visits to the dentist.

This study aimed to assess the caries prevalence and the caries experience, of 5, 12 and 15-year-old children and evaluate how their disease pattern is related to variables, such as gender, parental educational and rural-urban areas of the population.

MATERIAL AND METHODS

A stratified cluster sample was selected according to WHO guidelines for surveys, which ensures the participation of a satisfactory number of people that may present different disease prevalence in the conditions being examined (World Health Organization, 1987).

Stratified random sampling was used to select 5 schools. The sample totaled 200 children. Before examinations started we ensured all examiners were

calibrated for caries at surface level and for each age group with a reference examiner was taken as the "gold standard". Initially this calibration covered the theory of diagnostic criteria and common diagnostic problems, using images of all different clinical conditions of teeth with and without caries. The second session started with every examiner examining 10 children twice with the same children also examined once by the reference examiner. Results were then analysed and disagreements discussed.

All clinical examinations were carried out by the calibrated examiners, assisted by an assistant as a recorder. The examinations were held in the schools' classrooms, using reclining chairs and portable lights under standardized conditions recommended by the World Health Organization. Cotton rolls and gauze were available for moisture control and removal of plaque as necessary.

All dental surfaces were examined and caries was diagnosed at the cavitation level (D3) threshold according to the BASCD criteria and trainers' pack standards[11], using a visual method without x-rays, fibre-optic transillumination or compressed air. Data were recorded on individual charts and the following indices calculated: percentage of subjects with no evidence of dental caries (DMFT/dmft=0), dmft/DMFT and dmfs/DMFS indexes and the mean number of decayed (DT/dt), missing (MT/ mt) and filled (FT/ft) teeth for the permanent and primary teeth respectively. Additionally, the Care Index (CI) (ft/ dmft% or FT/DMFT%) and the significant caries index (SiC) representing the mean DMFT or dmft of the one third of each age group with the highest caries score were also calculated.[12]

Caries indices were analysed in relation to age, gender, county, urban/rural areas and parental education. Parental education was assessed in years of paternal and maternal education and categorized into four levels: <6 years (primary), 9 years (secondary/high school), 12 years (secondary), >12 years (higher).

The chi-square test was used for the comparison of proportions and the Student's t-test and ANOVA for the assessment of means. To explore how each sociodemographic variable affects caries prevalence in the presence of other variables, a multivariate linear regression analysis was performed. Data were processed and analysed with SPSS (PC version 10.0) with the level of statistical significance level set at <0.05.

RESULTS

The sample of the surveyed children was 1000, 800, and 700 in the 5-, 12- and 15-year-old groups respectively. The percentage of children without obvious caries declined with age from 57% for 5-year-olds to 37% and 29% for 12 and 15 year olds respectively. The crude unweighted mean dmft scores for 5-year-old children was 1.77, 2.05 for 12-yearolds and 3.19 for 15-year-olds.

Rural areas showed significantly higher means than urban areas only for the 5 and 15 year olds, namely: 2.56 cf 1.65 (p=0.001) and 3.72 cf 3.05 (p=0.005). Girls presented higher DMFT/ DMFS means than boys among both 12-year-olds, 2.28 cf 1.79 (p=0.005), and 15-year-olds, 2.90 cf 3.41 (p=0.031).. Also, children of all ages with a higher-educated parent had lower dmft/DMFT values: e.g. for 5-year-olds the mean dmft was 2.50 for mothers and 2.80 for fathers with least education decreasing to 1.37 and 1.21 for those with higher educational (p=001). The same trends were found for the 12 and 15-year-olds DMFT scores: 2.52/2.54 cf 1.42/1.44 and 3.65/3.73 cf 2.50/2.56, p=0.001.

Caries experience in the posterior teeth were 83% in 12- and 87% in 15-year-olds. Pit and fissure caries (occlusal of posterior teeth, buccal of the lower molars and lingual of the upper ones) contributed 56% and 58% of the total caries experience of these children. The SiC indexes of the unweighted population for 5-, 12- and 15-year olds were 5.01, 4.83 and 7.07 respectively.

Multivariate analysis (Table 1) revealed that the dmf-s/ DMF-S index of the children with higher-educated fathers with had significantly lower dmft-s/DMFT-s in each age group (p=0.012, 0.002, 0.016 respectively). For 5-year-olds, urban children and those of higher-educated mothers had lower dmft (p=0.001 and 0.010 respectively). Finally, among 12-year-olds, boys (p<0.006) and children of higher-educated mothers (0.025) scored significantly lower DMFT-S values.

Table 1: Multiple linear regression analysis for dmfs/DMFS by gender, location and parents' educational level of 5, 12 and 15-year-old children

5 year old					
Dependent variable	**Independent variables**	**b***	**se(b) ****	**t-test**	**p**
dmfs	Gender	0.125	0.372	0.335	0.738
	Location	-1.818	0.560	-3.244	0.001*
	Father's educational level	-0.596	0.237	-2.516	0.012*
	Mother's educational level	-0.645	0.249	-2.594	0.010*
12 year old					
Dependent variable	Independent variables	b*	se(b) **	t-test	p
dmfs	Gender	0.898	0.329	2.733	0.006
	Location	-0.206	0.408	-0.505	0.614
	Father's educational level	-0.551	0.181	-3.039	0.002

	Mother's educational level	-0.435	0.193	-2.252	0.025
15 year old					
Dependent variable	Independent variables	b*	se(b) **	t-test	p
dmfs	Gender	0.660	0.399	1.652	0.099
	Location	-0.907	0.499	-1.818	0.069
	Father's educational level	-0.531	0.220	-2.414	0.016
	Mother's educational level	-0.246	0.233	-1.053	0.292

b*: Constant, se(b)**: Standard error of the constant b

DISCUSSION

The objective of this first national survey was to determine the prevalence of dental caries in the children and adolescents and based on the findings to help the health authorities to plan better dental services and improve the dental health of the population.

Declining trends in caries prevalence of children and adolescents have been reported for the last two decades in many European countries.[13]

However, while WHO recording criteria were used, the examiners were not calibrated so caution must be exercised when making comparisons. Nevertheless, within the different districts of Greece, the mean DMFT values of 12-year-olds, showed a noticeable improvement over the 20-25 years, ranging from 26% to 66%, with a mean of 55%.[14]

No geographical variations of caries prevalence either north/south or east/west were observed, though large cities predictably scored lower caries prevalence and higher care index than smaller conurbations. Striking disparities in dental disease prevalence among people based on sociodemographic characteristics, such as income, location, and parental educational level are commonplace [15] and those poorer children suffer twice as much compared to their non-poor peers and their disease is more probably untreated. Such disparities were found in our study and children or adolescents living in small cities or in rural areas or with less-educated parents, presented higher prevalence of caries, more untreated caries (dt/DT) and less dental care (lower Care Index). These findings agree with other studies that attributed these findings to rural areas generally having fewer dentists per population and more poverty, and therefore, children with less access to and use of dental care.[16]

The low prevalence of sealants in the population (8%, Oulis et al., 2011)[17] may explain most of the caries being found on the occlusal surfaces of posterior permanent teeth.

Another possible explanation is that most of the caries was located on the occlusal surfaces of posterior teeth due to the fact, that the low use of sealants in adolescent (Oulis et al., 2011)[17] compared to Denmark and Finland where sealants are applied to almost 70% of children through national preventive programs. Application of sealant to the occlusal surfaces of posterior teeth have resulted in a 60% decrease in tooth decay up to 5 years after application (Gooch et al., 2009). The introduction of such a program combined with other preventive measures in our population might reduce the DMFT index to a considerable degree and reduce caries prevalence to the level of other European countries.[18]

CONCLUSION

In conclusion, although child and adolescent dental caries prevalence and extent has fallen, it is still much higher.

The great variation of caries prevalence found across the different locations with the worst DMFT figures and higher percentage of untreated caries found within the poorer and less educated families necessitates early intervention with comprehensive national preventive program targeted on these groups' children. Paternal educational level is a significant predictor of the extent of dental caries. It was negatively related to DMF values and to untreated dental caries. Since the majority of dental caries in the adolescents was found on the occlusal surfaces of the posterior permanent teeth, a preventive program with sealants on more tooth surfaces could eliminate caries to a large extent.

REFERENCES

1. Marthaler TM, Brunelle J, Downer MC, König KG, Truin GJ, Künzel W, O'Mullane DM, Møller IJ, von der Fehr FR, Vrbic V. The prevalence of dental caries in Europe 1990-1995. Caries research. 1996;30(4):237-55.
2. Marthaler TM. Changes in dental caries 1953–2003. Caries research. 2004;38(3):173-81.
3. Widstro¨m E, Hiiri A. Oral health care in Finland. Themes 1/1998. Helsinki: National Research and Development Centre for Welfare and Health; 1998.
4. O'Sullivan DM, Tinanoff N. The association of early dental caries patterns with caries incidence in preschool children. Journal of public health dentistry. 1996 Mar;56(2):81-3.
5. Sweeney A, Kinirons M. Recent dental attendance and levels of untreated caries in a sample of 11-12 year old children in Northern Ireland. Journal of the Irish Dental Association. 2000 Jan 1;46(2):55-9.
6. American Academy of Pediatric Dentistry and the American Academy of Pediatrics. Oral Heath Policies. Policy on early childhood caries (ECC): Classifications, consequences, and preventive strategies. Pediatr Dent 20052006;27:313.
7. Mattila ML, Rautava P, Sillanpää M, Paunio P. Caries in five-year-old children and associations with family-related factors. Journal of Dental research. 2000 Mar;79(3):875-81.
8. Mattila ML, Rautava P, Aromaa M, Ojanlatva A, Paunio P, Hyssälä L, Helenius H, Sillanpää M. Behavioural and demographic factors during early

childhood and poor dental health at 10 years of age. Caries research. 2005;39(2):85-91
9. Mattila ML, Rautava P, Ojanlatva A, Paunio P, Hyssälä L, Helenius H, Sillanpää M. Will the role of family influence dental caries among seven-year-old children?. acta odontologica scandinavica. 2005 Jan 1;63(2):73-84.
10. Julihn A, Barr Agholme M, Grindefjord M, Modéer T. Risk factors and risk indicators associated with high caries experience in Swedish 19-year-olds. Acta Odontologica Scandinavica. 2006 Jan 1;64(5):267-73.
11. Pitts NB, Evans DJ, Pine CM. British Association for the Study of Community Dentistry (BASCD) diagnostic criteria for caries prevalence surveys-1996/97. Community dental health. 1997 Mar 1;14:6-9.
12. Bratthall D. Introducing the Significant Caries Index together with a proposal for a new global oral health goal for 12-year-olds. International dental journal. 2000 Dec 1;50(6):378-84.
13. Whelton H. Overview of the impact of changing global patterns of dental caries experience on caries clinical trials. Journal of Dental Research. 2004 Jul;83(1_suppl):29-34.
14. Oulis CJ, Tsinidou K, Vadiakas G, Mamai-Homata E, Polychronopoulou A, Athanasouli T. Caries prevalence of 5, 12 and 15-year-old Greek children: A national pathfinder survey. Community Dental Health. 2011;20:1-8.
15. Källestål C, Wall S. Socio-economic effect on caries. Incidence data among Swedish 12–14-year-olds. Community dentistry and oral epidemiology. 2002 Apr;30(2):108-14.
16. Vargas CM, Ronzio CR, Hayes KL. Oral health status of children and adolescents by rural residence, United States. The Journal of Rural Health. 2003 Jun;19(3):260-8.
17. Oulis CJ, Berdouses ED, Mamai-Homata E, Polychronopoulou A. Prevalence of sealants in relation to dental caries on the permanent molars of 12 and 15-year-old Greek adolescents. A national pathfinder survey. BMC Public Health. 2011 Dec;11(1):1-7.
18. Gooch, B.F., Griffin, S.O., Kolavic, G.S., Kohn, W.G., Rozier, G.R., Siegal, M., Fontana, M. Brunson, D., Carter N., Curtis, D.K., Donly, K.J., Haering, H., Hill, L.F.H., Pitts, H., Kumar, J., Lampiris, L., Mallatt, M., Meyer, D.M., Miller, W.R., Sanzi-Schaedel, S.M., Simonsen, R., Truman, B.I. and. Zero, D.T. (2009): Preventing dental caries through school-based sealant programs. Updated recommendations and reviews of evidence. Journal of the American Dental Association, 140, 1356-1365.