



Caries Prevalence and Treatment Need Among Primary School Children in Taif, Saudi Arabia

KEYWORDS

Dental Caries, Prevalence, Treatment needs, Chi-square test

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ABSTRACT *Background & objectives: Many developed countries have shown a marked decrease in the prevalence of dental caries in children over the past decades. However, in many other developing countries caries prevalence has increased. Previous studies carried out in Saudi Arabia have shown a high prevalence of caries in both preschool, and school-aged children. A comparative analysis of dental caries experience and treatment needs of children according to the gender.*

Settings and Design: A cross-sectional study with a collection of primary data on caries prevalence and treatment needs in school children.

Subjects and Methods: A sample of 600 six-year-old and 600 twelve-year-old children were randomly selected by a two-stage cluster sampling method. Children were examined using the 1987 WHO caries criteria.

Statistical analysis used: Chi-square test, students t test was used for analysis. The level of significance adopted for all tests was 5%.

Results: The proportion of caries-free six-year-old children was 8.6% and 9.5% in boys and girls, respectively ($P = 0.063$). The mean dmft in 6 years old was 5.32. In twelve years old the proportion of caries free children was 23.7% of boys and 34.2% in girls ($p=0.047$). The mean DMFT \pm SD was 3.71 \pm 2.28 (3.78 \pm 2.3 for boys and 3.64 \pm 3.27 in girls) ($P>0.05$). The FT component in 12- year group showed statistically significant gender variation ($p=0.039$). Higher treatment needs were found among boys in 12 year age group schoolchildren (TN = 80.7%) compared with the girls (TN = 70.3%) ($P = 0.059$). Restorative treatment was the major treatment needed in this population.

Conclusions: The data show that treatment needs were more in boys when compared to the girls. The difference in number of filled teeth in 12 year age group among boys and girls suggests that there is a gross discrepancy in providing dental care to girls in the region of Taif, Saudi Arabia.

Introduction:

Many developed countries have shown a marked decrease in the prevalence of dental caries in children over the past decades. However, in many other developing countries caries prevalence has increased⁽¹⁻⁴⁾. Previous studies carried out in Saudi Arabia have shown a high prevalence of caries in both preschool^(5,6,7) and school-aged children^(8,9,10). In one study in Riyadh city the decayed, missing and filled teeth (dmft) of 6-year-old children was 4.14 for boys and 3.43 for girls, and 22.3% of the children were free of caries in their primary teeth.⁽¹¹⁾ Fourteen years later, a subsequent study showed a higher level of disease. The dmft was 8.13 for boys and 6.48 for girls, and only 5.6% of the children were free of caries.⁽¹¹⁾

In 1981, the World Health Organization (WHO) acknowledged the serious consequences of dental caries in children by setting ambitious goals for the year 2000.⁽¹²⁾ Although dental caries prevalence in developed countries has declined over the past decades, these goals are still not met for a significant proportion of the world's population.⁽¹³⁾ Dental caries is increasing in developing nations due to an array of factors, which include the intake of cariogenic foods, exposure to fluorides, socioeconomic status, ethnicity, health, age, access to oral health services, and other lifestyle factors.^(12,14) Most studies surveyed a limited

geographic area and age group. However, two studies included a nationwide survey of dental caries.^(15,16) One survey is more than a decade old and included only 12–13 year olds⁽¹⁵⁾, and the other survey is more recent, but the samples were more representative of the country's fluoride levels rather than its population.⁽¹⁶⁾ Dental caries was defined according to the WHO criteria in most of these studies.⁽¹⁷⁾ A single assessment of nursery school students by Al-Malik provided data for three different papers and diagnosed caries using criteria from the British Association for the Study of Community Dentistry (BASCD).^(18,19,20)

It is imperative to obtain baseline oral health information to plan for and to identify improvements in children's oral health status. In Saudi Arabia, a number of studies on the prevalence and severity of childhood caries have been performed but not emphasizing on treatment needs and gender disparity.

Therefore the aim of the present study was to obtain caries prevalence among school children in Taif, KSA and correlate with the treatment needs based on gender.

Subjects and Methods:

The sample was drawn from 6- and 12-year-old children attending primary and secondary schools in Taif, the West

Province of Saudi Arabia during August- December 2013.

The study included a total of 1200 children (600 each for six and 12 year age group) randomly selected from the schools. The schools were selected by systemic random sampling and a specific number of children was selected in every alternative school (first school decided by lottery method) for both the age groups under consideration.

The sample was calculated in advance, based on the estimates of the average and standard deviation for the DMFT index for this age group in the Saudi Arabian prevalence studies and adjustment for finite population.

Letters were sent to the parents requesting consent to their child being examined in schools. All the selected children's participated in the clinical examination. Before inclusion in the study, the study was approved by the Local Ethics Committee.

In order to find the prevalence and severity of caries, and treatment needs, criteria and indexes recommended by WHO were used.¹⁴ The oral and dental examination was performed in natural light, drying teeth with gauze – without previous brushing or prophylaxis. Individuals were examined on school chairs or on tables. The oral examination was conducted using No.4 mirror and for caries examination sickle explorer No.5 was used.

There were two examiners (male examiner for boys and female examiner for girls) and two note keeper duly trained to execute this stage of the oral examination. The examiners were submitted to agreement tests – intra and inter examiner Kappa Calculation to adjust the subjective diagnosis criteria for caries before going to the field, and whose value was equal to 0.98 and 0.93 respectively.

Statistical analysis

The database was set up in Microsoft Office 2003 Excel, and submitted to analysis in the Statistical Analysis Systems – SPSS – program, version 20. IBM, USA. Descriptive statistical analysis was based on calculating central trend measures – such as mean and standard deviation for the variables- prevalence and severity of dental caries in primary and permanent teeth and need for treatment, according to gender. Chi-square test, students t test was used for analysis. The level of significance adopted for all tests was 5%.

Results:

Table 1 and 2 show the gender wise distribution of study subjects and prevalence of dental caries in 6- year and 12- year age group respectively.

The proportion of caries-free six-year-old children were 8.66% (n=25/300) and 9.66% (n=29/300) in boys and girls, respectively (P = 0.063) which was not statistically significant (Table 1). The mean dmft in six year age group was 5.32±3.72(5.71 in boys and 4.93 in girls). Unpaired t test for differences in mean dmft in the 6 year age group was not statistically significant (p= 0.072) (Table 3).

In twelve years old the proportion of caries free children was 23.7% of boys and 34.3% in girls showing statistically significant gender variation (p=0.047) (Table 2) with more boys having dental caries compared to the girls. But, the mean DMFT±SD was 3.78 ±2.3 for boys and 3.64 ±3.2 in girls which was not statistically significant (P=0.064) (Table 4).

The dt, mt and ft component in 6- year age group was not statistically significant among gender comparison with p values 0.08, 0.77 and 0.93 respectively (Table 3). Where as in 12- year age group FT component showed statistically significant gender variation with p=0.039 (Table 4) with mean FT component of 1.11±1.60 for boys and 0.31±0.60 for girls. This result showed that in the present study more boys underwent some restorative treatment compared to girls and had a higher number of filled component contribution to the over DMFT score.

The subjects were clinically assessed for both preventive and curative treatment care, based on their caries experience and dentition status. Preventive care needs included caries arresting care and fissure sealing. Out of 600 individuals in 6- year age group, 81 subjects (37 boys and 44 girls) required preventive treatment (Table 5). In 12- year group no treatment need showed statistically significant gender variation except for pulp treatment wherein 55 boys required pulp treatment for one or more teeth compared to 30 girls (p=0.042) (Table 5). In the whole study sample the major treatment need was restorative treatment. Given the fact that, in the present study the prevalence of dental caries was less in girls compared to boys in 12- year group (p=0.047) (table 2), the restorative treatment need for girls was equally high as that for boys but not statistically significant (p=0.069) (table 5).

The treatment needs for 6- year age group (mean dmft 5.32±3.02) were 94.3% and 92% for boys and girls respectively. In 12- year group (mean DMFT 3.71±2.28) slightly higher percentage of treatment needs were recorded for boys (80.3%) compared to girls (70.3%) (Table 5), but without statistical significance (p=0.059).

Discussion:

The aim of the study was to determine the prevalence, severity, and treatment needs of caries in 6- and 12-year-old children in schools in Taif city and show the extent of the disease in this community in order to determine the treatment needs and preventive efforts required to improve the oral health of the children in this population. The study was a part of an oral health promotion program in these schools to promote oral health in this selected group of children. Recent studies carried out in Saudi Arabia have demonstrated caries represents a particular problem among school children in this country.^{8,9,10,11,15}

Caries prevalence and dmft scores were found to be very high among this group of children. Ninety-one percent of the children had clinical caries with an average of eight teeth per child affected with caries. There was no significant difference between caries prevalence and dmft in relation to gender in 6 years group while statistical difference in caries prevalence was present in 12 years group. The decay component was the major part of dmft scores, which indicates a high percentage of untreated caries and a high treatment need for these children. Previous studies in Saudi children have also reported decay as the major component of dmft scores.^{6,8,11,12,15,16}

The prevalence estimates for caries were higher than those reported in earlier studies in different parts of Saudi Arabia.^{9,11,16}

In Jeddah city reported prevalence of dental caries for 6-year-old children have been in the range of 70-76%, and dmft scores have ranged from 2.9 to 6.3.^{8,12}The values in the present study are also higher than estimates for young-

er children in other parts of the country. Prevalence ranging from 45% to 89% and dmft values from 0.2 to 7.12^{6,15,17} have been reported in previous studies. In the current study, although the dmft score in six year age group was 5.32±3.72, it is higher than earlier reported from the city of Jeddah^{8,12}, these scores were comparable to reports from the similar community^{18,19} but in different parts of the country. A study in the northwest region of the country showed a dmft score of 7.66 and 7.5% of the children were caries-free.¹⁸ A second report from Riyadh Armed Forces Schools for girls, showed a dmft score of 8.1, and 3.0% of the children were caries-free.¹⁹

Additionally, in previous study conducted in India on 309 school students between 6-10 years, it stated that, caries prevalence among boys were 69.73%, while in girls were 68.38% and the difference was not statistically significant.²⁰ The difference in caries prevalence in the present study may be attributed to the difference in sample size but with similarity of high prevalence.

The treatment needs for 6- year age group (mean dmft 5.32±3.02) were 94.3% and 92% for boys and girls respectively. In 12- year group (mean DMFT 3.71±2.28) slightly higher percentage of treatment needs were recorded for boys (80.3%) compared to girls (70.3%), but without statistical significance (p=0.059) previous data point as an indicator for the need of applications in the field of preventive dentistry in this region. Similarly, Asokan et al., 2007²¹ stated that, there was no significant difference in treatment needs between the male and female in younger age groups. An age-wise comparison of the treatments required in different age groups, however, showed a significant difference in older children, which included fluoride therapy, restorations, extractions and orthodontic treatment.²¹ The need for orthodontic treatment was not assessed in the present study since the prevalence of malocclusion and orthodontic treatment need was beyond the scope of the present study objective.

Although, the percentage of untreated caries in other study is extremely high in both dentitions, the increased dental treatment needs found in the present study may be

attributed to the geek oral health care system which is primarily delivered by the private sector, and in combination with the high cost of dental treatment and the extremely low public sector dental expenditure, has significant implications in the use of dental services.²² Similar percentages of untreated caries are usually found in developing countries^{23,24,25} or in certain regions within developed countries associated mainly with geographic, economic and cultural barriers to dental care.^{26,27} Although boys were in need of more treatment compared to girls of 12- year age group in the present study, it has been found that boys had undergone more restorative treatment than girls. This could suggest that boys were getting a preference for receiving dental treatment compared to girls.^{28,29,30}

Within the limitations of the present study it can be concluded that, the prevalence of caries among 6- year old was high and moderate among the 12-year-old population in Taif, Saudi Arabia. The mean DMFT was above the target level established for the year 2000 by the FDI/WHO. The data show that treatment needs were more in boys when compared to the girls. The difference in number of filled teeth in 12 year age group among boys and girls suggests that there is a gross discrepancy in providing dental care to girls in the region of Taif, Saudi Arabia. However, future research considering the confounding factors such as fluoride level, oral hygiene practices and availability and affordability dental treatment services in the population under consideration are necessary for better insight into the problem of dental caries and treatment needs.

Conclusion: the results of this study proved that treatment needs were more in boys when compared to the girls. The difference in number of filled teeth in 12 year age group among boys and girls suggests that there is a gross discrepancy in providing dental care to girls in the region of Taif, Saudi Arabia.

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