

# Caries prevalence in Saudi primary schoolchildren of Riyadh and their teachers' oral health knowledge, attitude and practices

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## ABSTRACT

**Objectives:** The purpose of the present study was to determine the caries prevalence and severity in primary school children Riyadh, Kingdom of Saudi Arabia, and to assess the oral health knowledge, attitude and practices of their teachers.

**Methods:** A random sample of primary schoolchildren was examined for dental caries utilizing World Health Organization criteria for diagnosis of caries. The information regarding oral health knowledge, attitude and practices in schoolteachers was collected through an especially designed self-administered questionnaire.

**Results:** The prevalence of caries among the sample was 94.4%. The mean decayed, missing and filled score for primary teeth of the sample was 6.3 ( $\pm 3.5$ ), with decay component of 4.9 ( $\pm 3.1$ ), missing component of 1.1 ( $\pm 1.7$ ) and filled component of 0.3 ( $\pm 1.0$ ). The mean decayed, missing and filled score for permanent teeth of the sample was 1.6 ( $\pm 1.5$ ) with decay component of 1.5 ( $\pm 1.4$ ) as the major component. All the teachers (100%) thought that

good dental health was important for general health and that routine check up dental visits help in maintaining good dental health. All the teachers (100%) thought that tooth cleaning using brush or miswak was important for good dental health. Regarding the caries risk factors, the majority of teachers understood the main causes of dental caries such as poor oral hygiene (97.4%) and high sugar intake (97.4%). Almost all the teachers (97.4%) thought that dental health lectures were of great importance for their students but less than half (41%) actually spent time on teaching proper oral health care.

**Conclusions:** The caries prevalence in Riyadh primary schoolchildren is very high. The teachers' knowledge regarding oral health is satisfactory and their attitude towards oral health is very positive.

**Keywords:** Dental caries, primary schoolchildren, oral health knowledge, primary schoolteachers.

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There have been several reports on the caries prevalence of Saudi primary schoolchildren.<sup>1-4</sup> Al-Sekait and Al-Nasser<sup>1</sup> in their study of Riyadh primary schoolchildren reported a caries prevalence of 68% with combined primary and permanent mean decayed filled and missing score of 2.0. The mean decayed, missing and filled teeth score for primary teeth (dmft) was less than 1.0 in 6-year-olds, rose to

slightly more than 1.0 at 8 years and then declined by the age of 11 years. The mean decayed, missing and filled teeth score for permanent teeth (DMFT) was almost zero at the age of 6 years and gradually rose to 3.0 by the age of 13 years. Al-Shammery et al<sup>2</sup> in their study of Riyadh primary schoolchildren reported a mean DMFT of 0.78 and a mean dmft of 3.52 amongst the 9-year-old male children. Al-

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Khateeb et al<sup>3</sup> reported a mean DMFT of 5.1 and 2.1 in 12-year olds from public and private schools in Jeddah, Kingdom of Saudi Arabia. There has been no published data available on dental caries of Riyadh Saudi primary schoolchildren since 1991.

Oral health habits are formed early in life. The schoolteachers, especially primary schoolteachers, can play an important role in grooming healthy habits in their students.<sup>5,6</sup> In order to instill healthy preventive oral habits, the teachers themselves need to have a good knowledge and attitude towards oral health. There have been reports on the knowledge and attitudes of the intermediate and high schoolteachers towards prevention,<sup>7</sup> but there have been no published reports in the primary school teachers in Riyadh, Kingdom of Saudi Arabia. An internship seminar project did report the oral health knowledge of primary schoolteachers as component of a project on caries status, hygiene and fluorosis.<sup>8</sup> The purpose of the present study was bi-fold. Firstly, to determine the caries prevalence and severity in primary school children and ascertain if there have been any changes in the 10-year period since 1991. Secondly, to determine the oral health knowledge, attitude and practices of their teachers.

**Methods.** A random sample of Grade III children was selected from the primary schools in Riyadh, Kingdom of Saudi Arabia. The Riyadh city is divided into 5 educational zones such as Central, Northern, Western, Eastern and Southern. The total number of primary schoolchildren was 191,940 with 13% in Central, 15% in Northern, 12% in Western, 28% in Eastern and 31% in the Southern zone. Al-Shammery et al<sup>9</sup> reported a mean dmft of 3.15(±2.87) in primary schoolchildren of Riyadh, Kingdom of Saudi Arabia. The sample size was determined utilizing the sample size formula for estimating mean.<sup>10</sup> The total sample was calculated as 380 with 95% confidence interval and maximum error of 0.4 mean dmft. In Riyadh, 17% of primary

schoolchildren study in private schools. The sample was divided into private and public school according to the above ratio. Therefore, the sample size of the private schoolchildren was 65, that is 17% of the total sample. The remaining sample was further divided into 5 groups according to the percentages given above for the 5 zones. The actual number of children later examined became 449. The extra sample was due to the clustering effect

The children were examined by 2 examiners under natural light using a disposable mirror. The World Health Organization (WHO) criteria were utilized for the diagnosis of the dental caries.<sup>11</sup> The intra-examiner reliability was 0.91 and 0.89 for the 2 examiners. The inter-examiner reliability was 0.86 utilizing the Kappa method.

The information regarding oral health knowledge, attitude and practices was collected through a specially designed self-administered questionnaire. All the information was entered into a computer utilizing FOXPRO Program. Statistical package for social sciences (SPSS version 9.0) was utilized to calculate the descriptive statistics and statistical tests. The analysis of variance test was used to analyze any difference in mean dmft/DMFT scores between various groups. The Tukey's Post-Hoc test was utilized to determine which of the groups were significantly different. The Chi-square test was used to ascertain any significant difference in practices of teachers from various zones.

**Results. Dental caries.** A total of 449 children were examined for dental caries. The mean age was 8.9 (±0.8) years with age range 7-11 years. The prevalence of caries in the sample was 94.4%. The mean dmft of the sample was 6.3 (±3.5), with "d" component of 4.9 (±3.1), "m" component of 1.1 (±1.7) and "f" component of 0.3 (±1.0). The mean DMFT was 1.6 (±1.5) with "D" component of 1.5 (±1.4), "M" component of 0.07 (±0.47) and "F" component of 0.03 (±0.26). The mean dmft score

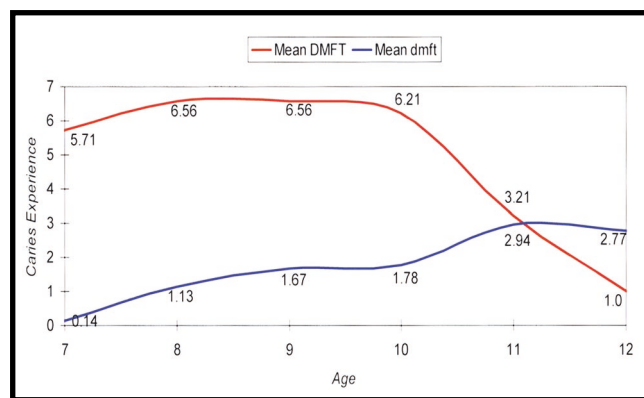


Figure 1 - Caries experience by age.

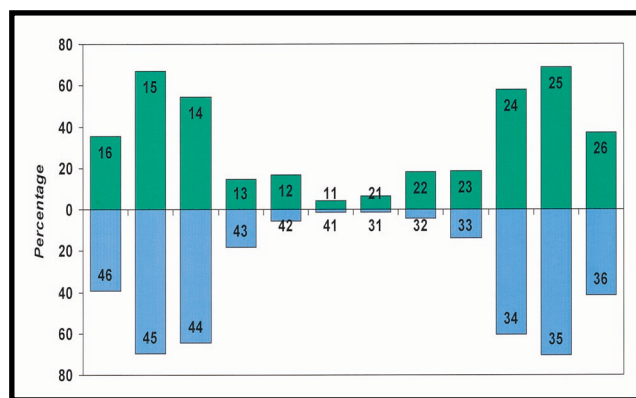


Figure 2 - Caries prevalence by individual permanent teeth.

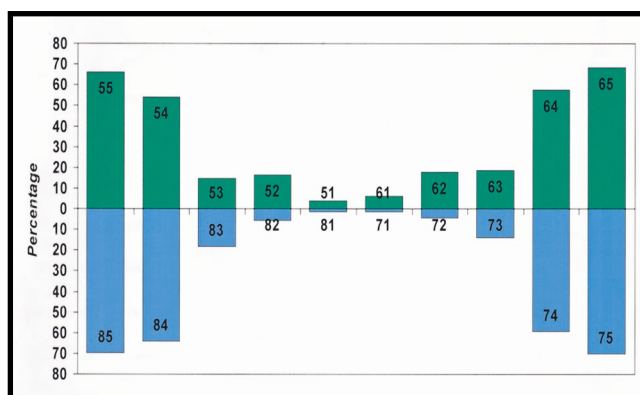


Figure 3 -Caries prevalence by individual primary teeth.

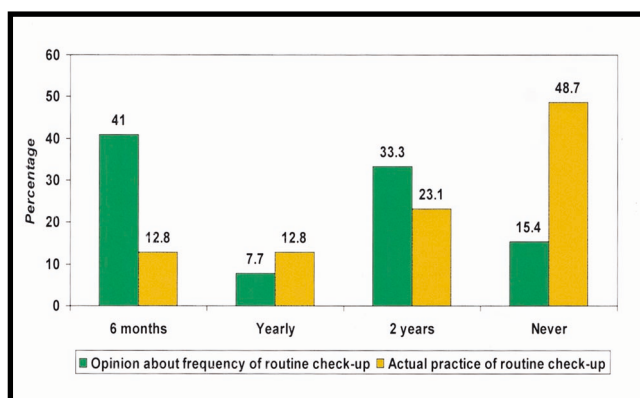


Figure 4 -Routine dental check up.

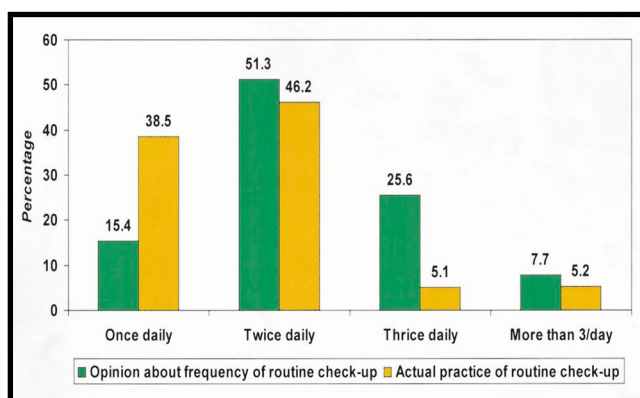


Figure 5 -Tooth cleaning amongst the teachers.

increased across the age from 5.7 at 7 years to 6.6 at 9 years and then declining to 1.0 at 12 years (Figure 1). The mean DMFT gradually increased across the age from 0.1 at 6 years to 2.9 at 12 years (Figure 1).

The mean dmft score was 7.03 for Central zone, 7.21 for Northern zone, 6.58 for Western zone, 7.19

for Eastern zone, 6.6 for Southern zone and 3.76 for private school. There was no significant difference in caries experience of children from public schools. But there was a significant difference ( $P < 0.01$ ) in caries experience between children from public and private schools.

Among the primary teeth, mandibular 2nd molars were most affected by caries and the mandibular central incisors were the least affected teeth (Figure 2). Among the permanent teeth, the mandibular 2nd premolars were the most affected while the mandibular incisors were the least affected teeth (Figure 3).

**Questionnaire.** A total of 39 teachers completed the questionnaire. All the teachers thought that good dental health was important for good general health and that routine check-up dental visits help in maintaining good dental health. A majority of teachers (41%) thought that the frequency of routine dental check-up visits should be every 6 months, but only 12.8% actually practiced the 6-month routine dental check up visits. A majority actually never made a routine check up visit (Figure 4). All the teachers thought that tooth cleaning using brush or miswak was important for good dental health. While one-fourth (25.6%) of the teachers thought that the teeth should be cleaned 3 times daily, only one in 20 (5.1%) actually brushed thrice daily and more than one-third (38.5%) brushed once daily (Figure 5). Approximately two-thirds (64.1%) used both toothbrush and miswak, 17.7% toothbrush and 17.9% miswak only for tooth cleaning. All those using toothbrush used toothpaste. A great majority of teachers (89.2%) thought that fluoridated toothpaste was more useful in caries prevention. Regarding the caries risk factors, the majority of teachers understood the main causes of dental caries such as poor oral hygiene (97.4%) and high sugar intake (97.4%) but one-third (28.2%) did not think frequent intake of soft drinks as a caries risk factor.

Almost all the teachers (97%) thought that dental health education lectures were of great importance for their students but less than half (41%) actually spent time on teaching proper oral health care.

**Discussion. Caries in primary schoolchildren.**

One of the aims of present study was to provide information regarding caries prevalence in Saudi schoolchildren in Riyadh, and note any change in caries situation during last decade. The results of the present study show that the caries prevalence has increased to a very serious level as compared with the previous studies.<sup>1,2</sup> The mean dmft score has doubled as compared to the Al-Shammery et al<sup>2</sup> report in 1990, and increased 6 times as compared with the Al-Sekait and Al-Nasser<sup>2</sup> report of 1988 in a similar population. The mean DMFT score has also doubled as compared with the Al-Shammery et al<sup>2</sup>

report in a similar age group. The increase in caries prevalence and severity calls for combined preventive efforts by the health and education authorities.

The decay component was the major contributor both in dmft (78%) and DMFT (93%) scores. It indicates towards a high proportion of untreated caries and immediate need for providing restorative services to these children. The increase in the caries prevalence, severity and need for restorative services in turn indicates towards initiation of an organized school dental service. Such a service could be effective in providing both preventive and restorative dental services and consequently control the serious caries situation in the study population.

The mean dmft score was the highest in 9-year olds and lowest in 12-year olds. This is a normal pattern. The decrease in dmft results from exfoliation/extraction of carious and filled teeth. The mean DMFT score was almost zero in 7-year olds and approximately 3 in 12-year-olds. This is again in agreement with the previous reports.<sup>1</sup> As the age increases, more permanent teeth erupt. If the cariogenic environment continues to persist, more and more permanent teeth get carious. The phenomenon could possibly be controlled through preventive intervention such as oral hygiene and dietary advice, topical fluoride applications and fissure sealants where indicated. The caries experience of the children from private school was considerably low as compared with the public schoolchildren. Al-Khateeb *et al*<sup>3</sup> have reported similar differences in Jeddah schoolchildren. The low caries experience of the private schoolchildren could possibly be attributed to educational level of parents of these children and better access to dental health services. The mandibular primary 2nd molars and the mandibular 2nd premolars were the teeth with the highest caries prevalence amongst the primary and permanent teeth. It implies a careful monitoring of these teeth for dental caries through clinical examination and intra-oral radiographs.

**Teacher's survey.** All the teachers surveyed were aware of the importance of good dental health and regular dental check-up visits to maintain good dental health. Half of them actually never made a routine dental check-up visit. This indicates a discrepancy between the attitude and the actual practice, and a need for continuous reinforcement of good preventive habits from the dental health care workers. All the teachers knew that tooth cleaning with brush or miswak was important for good dental health. But again there was a discrepancy in the opinion regarding the optimum tooth cleaning frequency and the actual practice. Nevertheless, two-thirds were cleaning their teeth twice or more per day. The results are in agreement with the study by Al-Mansour and Al-Zarea<sup>8</sup> in a similar population.

About two-thirds of the teachers were using both brush and miswak and the majority of those using a brush used fluoridated toothpaste. It is probably beneficial for the dental health to combine the traditional miswak method and modern toothbrush/toothpaste method especially in view of the benefits reportedly associated with the use of miswak.<sup>12</sup>

The knowledge of the teachers regarding the caries risk factors was good with the exception of frequent intake of soft drinks. It appears that there is a need for providing more information to the teachers in this particular area. Almost all the teachers thought that lectures on dental health education were important for their students. But, less than half of them were spending time on such lectures. The discrepancy here could be attributed to several factors such as lack of administrative policy, confidence in their oral health knowledge and availability of teaching materials. The results indicate that although there are some shortcomings in the area of preventive practices, yet the teachers' knowledge regarding oral health is satisfactory and their attitude towards oral health is very positive. The results are in agreement with the studies by Al-Tamimi and Petersen<sup>5</sup> and Al-Mansour and Al-Zarea<sup>8</sup> who reported an overall positive attitude of teachers towards prevention and participation in oral health education of children.

Keeping in view the seriousness of the caries problem in Riyadh primary schoolchildren, there is a need for further utilization of teachers in the area of dental disease prevention. Their attitude is very positive and their knowledge could be further enhanced through guidance from the dental health care workers.

The results of such questionnaire surveys should always be viewed with caution. There is possibility of a bias created by the tendency for favorable responses to the questions, especially when the respondents are aware that the survey is being carried out by dental specialists from a reputable institution.

In conclusion, the caries prevalence and severity in male primary schoolchildren of Riyadh, Kingdom of Saudi Arabia has increased to a very serious level since last decade. The decay component was the major contributor both in dmft (78%) and DMFT (93%) scores, which indicates a high proportion of untreated caries. The caries experience of the children from private school was considerably low as compared with the public school children. All the teachers were aware of the importance of good dental health and regular dental check-up visits to maintain good dental health. The knowledge of the teachers regarding the caries risk factors was good with the exception of frequent intake of soft drinks. Almost all the teachers thought that lectures on dental health education were important for their students. But, less than half of them were spending time on such lectures. The results indicate that although there are some shortcomings in the area of preventive

practices, yet the teachers' knowledge regarding oral health is satisfactory and their attitude towards oral health is very positive.

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