

# Determinants of Dental Caries in Primary School Going Children of Multan

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## ABSTRACT

**Background:** Dental caries is considered most common chronic childhood disease globally. Risk factors, for example, behavior, life style, social status, eating habits, hygiene and socio-demographic factors contribute to caries development. Daily activities are affected by oral diseases, among these activities; decreased performance and increased absenteeism in schools are most common.

**Aim:** To assess the determinants of dental caries among primary school going children of Multan.

**Method:** A cross-section study was conducted in Multan during November, 2015 in which 152 primary school children of Govt. Primary School Kotla Noor Shah, Muzaffarabad, Multan were included.

**Results:** Out of 152 primary school children, 73% were male and 35.5% were aged 9-10 years. A large number (89.5%) of children brushed their teeth regularly. 98% children cleaned their teeth with toothpaste. 82.9% consumed sweet and toffees. 87.5% children had no gingivitis and 88.2% had no calculus deposits. Major proportion (91.4%) of children had no bleeding gums. Oral hygiene was observed satisfactory in 84.9% children. Among 136 children who brushed their teeth regularly, 84 had dental caries and among 126 children who used sweet and toffees, 84 had dental caries.

**Conclusion:** Among children overall hygiene was found satisfactory. Dental caries was prevalent among 61.8% children. Majority of children who used sweet and toffees had dental caries.

**Keywords:** Gingivitis, Calculus deposits, streptococcus Mutans, oral disease

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## INTRODUCTION

Dental caries is described as a transmittable microbiologic illness of teeth wherein Streptococcus mutans is believed to be leading etiological agent that causes localized destruction and dissolution of calcified tissues. It is one of the most frequently observed oral disease that demonstrates an important socioeconomic patterns, geographic variation and acuteness of distribution worldwide<sup>1</sup>.

Globally, school going children are affected by dental caries due to chewing problems, pain, speech difficulties, psychological problems, lower quality of life and general health chaos<sup>2</sup>. It is believed that worldwide dental caries is single most common persistent childhood disease which leads to considerable economic loss caused by dental treatment heavy cost. During last two decades several developed states have experienced a significant decrease in dental caries prevalence and it is attributed to improved living environment, healthy lifestyle adoption, enhanced self-care behavior, adequate utilization of fluoride and organization of oral health related programs<sup>3</sup> while growing levels of the dental caries have been seen in developing states<sup>4</sup>.

According to World Health Organization (WHO) estimation, five billion individuals of world 6.5 billion populations are affected due to dental caries<sup>5</sup>. Globally 60 to 90% school going children are observed with dental cavities, frequently leading to discomfort and pain<sup>6</sup>. Children aged 12 years represents a normal age category utilized by WHO to evaluate and compare the levels of dental caries in permanent dentition of the children globally<sup>7</sup>. Virtually 70% of world states have achieved World Health Organization goal of DMFT (decayed, missing and filled teeth) index 3 for children aged 12 years. While World Health Organization global data demonstrated a rise in DMFT score from 0.9 to 1.38 among Pakistani children aged 12 years<sup>8</sup>.

Dental caries in Pakistan is considered most common childhood disease which is five times more common than asthma and seven times more prevalent than hay fever. The 71.7% prevalence of dental caries has been recorded among children aged 6-14 years in Karachi. Comparable decay levels were observed in Peshawar (72.4%) among school children from class 1-6. A study indicated that prevalence of dental caries in Sargodha district was 45.9% among children aged 3-12 years and in Islamabad and Rawalpindi its prevalence was 44.4% among children aged 5 years<sup>9</sup>. An analysis carried out during 2004 showed that total DMFT score among permanent dentition in rural area was 1.59 among aged twelve years, growing to 2.26 in children aged fifteen years, 8.73 in adults aged 35 to 44 years

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and 18.9 among people aged 65 years and above. Hence, caries rising trend among growing individuals highlighted the need of oral health and knowledge about preventive and curative services<sup>10</sup>.

Dental caries risk factors comprise salivary composition and flow, immune components, cariogenic bacteria available, insufficient fluoride exposure and hereditary factors. Although, several other factors, for example, behavior, life style, social status, eating habits, hygiene and socio-demographic factors contribute to caries development, as well. Daily activities are affected by oral diseases, among the activities; decreased performance and increased absenteeism in school and workplace have significant psychological and economic impacts and can cause considerable reductions in quality of life of individuals<sup>11</sup>.

Dental caries can be prevented through several ways; the most imperative method is to teach children. For this purpose school based dental health care programs have been shown effective to reduce the incidence of dental caries<sup>8</sup>. It was indicated that some developing states currently initiated oral health education program at school levels to improve oral health practices and stats of children and encouraging results were found from this health program which was carried out in China, Brazil, Madagascar and Indonesia<sup>3,12</sup>.

Most of the children are being affected in Pakistan as there is limited current information regarding dental caries prevalence and oral health practices among children. So it is pertinent to know the determinants of dental caries among primary school going children of Multan. The result of the study will help to prevent children from dental caries and to improve their oral health status.

## MATERIAL AND METHODS

It was cross-sectional descriptive study in which 152 primary school going children of Govt. Primary School Kotla Noor Shah, Muzaffarabad, Multan were included. Data was collected through questionnaire, which was entered using SPSS 20.0. Confidentiality of the data was ensured and proper consent was obtained before data collection.

## RESULTS

Table 1 demonstrates that out of 152 children, 31(20.4%) were 5-7 years old and 54(35.5%) children were 8-10 years old while 67(44.1%) children were 11-12 years. Among children, 111(73%) were male and 41(27%) were females. Table 2 identifies that out of 152 children, mainstream 136(89.5%) brushed their teeth regularly and 16(10.5%) children did not

brush regularly. Out of these children, 149 (98.0%) cleaned their teeth with toothpaste and only 3(2%) children cleaned their teeth with manjan or powder.

Table 3 highlights the dietary habits of children and found that among 152 children, 9(5.9%) chewed daily pan/supari and 56(36.8%) chewed occasionally while majority 87(57.3%) did not chew pan/supari. Among these children, 126(82.9%) consumed sweet and toffees and only 26(17.1%) children did not consumed sweet and toffees.

Table 4 describes that among primary school children, 129(84.9%) had satisfactory oral hygiene, 19(12.5%) had gingivitis, 97(63.8%) children had staining of teeth, 18 (11.8%) had calculus deposits and 13(8.6%) had bleeding gums. Result shows that among 152 children, 94(61.8%) had dental caries and 58(38.2%) children were free from this disease

Table 5 demonstrates that out of 136(89.5%) children who brushed their teeth regularly, 84(55.3%) had dental caries and out of 16 (10.5%) children who did not brush teeth regularly, 10 (6.5%) had dental caries. The result was statistically not significant as the p value was 0.95.

Table 6 elucidates that out of 126 (82.9%) children who consumed sweet and toffees, 84(55.3%) had dental caries and out of 26(17.1%) children who did not consume sweet and toffees, 16(10.5%) had dental caries. The result was statistically significant as the p value was 0.00.

Table-1: Children's profile

| Variable    | No. | %    |
|-------------|-----|------|
| <b>Age</b>  |     |      |
| 5-7 years   | 31  | 20.4 |
| 8-10 years  | 54  | 35.5 |
| 11-12 years | 67  | 44.1 |
| <b>Sex</b>  |     |      |
| Male        | 111 | 73.0 |
| Female      | 41  | 27.0 |

Table 2: Children's hygiene practices

| Hygiene practice                      | No. | %    |
|---------------------------------------|-----|------|
| <b>Brush teeth regularly</b>          |     |      |
| Yes                                   | 136 | 89.5 |
| No                                    | 16  | 10.5 |
| <b>Method used for teeth cleaning</b> |     |      |
| Toothpaste                            | 149 | 98.0 |
| Manjan/powder                         | 3   | 2.0  |

Table 3: Children's dietary habits

| Dietary habits                  | No. | %    |
|---------------------------------|-----|------|
| <b>Chewed pan/supari</b>        |     |      |
| Daily                           | 9   | 5.9  |
| Occasionally                    | 56  | 36.8 |
| No                              | 87  | 57.3 |
| <b>Use of sweet and toffees</b> |     |      |
| Yes                             | 126 | 82.9 |
| No                              | 26  | 17.1 |

Table 5: Relationship between brushing practices and dental caries among children

| Brush teeth regularly | Dental caries |           | Total      |
|-----------------------|---------------|-----------|------------|
|                       | Yes           | No        |            |
| Yes                   | 84(55.3%)     | 52 34.2%) | 136(89.5%) |
| No                    | 10(6.5%)      | 6(4.0%)   | 16 (10.5%) |

Chi square = 0.00 P value = 0.95

Table 6: Relationship between use of sweets & toffees and dental caries among children

| Use of sweet and toffees | Dental caries |           | Total      |
|--------------------------|---------------|-----------|------------|
|                          | Yes           | No        |            |
| Yes                      | 84(55.3%)     | 42(27.6%) | 126(82.9%) |
| No                       | 16(10.5%)     | 16(10.6%) | 26 (17.1%) |

Chi square = 7.26 P value = 0.00

Table 4: Children's orodental health examination

| Oroodental health examination | No. | %     |
|-------------------------------|-----|-------|
| <b>Oral hygiene</b>           |     |       |
| Satisfactory                  | 129 | 84.9  |
| Unsatisfactory                | 23  | 15.1  |
| Total                         | 152 | 100.0 |
| <b>Gingivitis</b>             |     |       |
| Yes                           | 19  | 12.5  |
| No                            | 133 | 87.5  |
| <b>Staining of teeth</b>      |     |       |
| Yes                           | 97  | 63.8  |
| No                            | 55  | 36.2  |
| <b>Calculus deposit</b>       |     |       |
| Yes                           | 18  | 11.8  |
| No                            | 134 | 88.2  |
| <b>Bleeding gums</b>          |     |       |
| Yes                           | 13  | 8.6   |
| No                            | 139 | 91.4  |
| <b>Dental caries</b>          |     |       |
| Yes                           | 94  | 61.8  |
| No                            | 58  | 38.2  |

## DISCUSSION

Dental caries is still a leading public health problem among developing countries but industrialized state have experienced a considerable decrease in dental caries due to improved living environment, healthy lifestyle and adequate utilization of fluoride etc. Current study was carried out to assess the determinants of dental caries among primary school going children of Multan. During study a total of 152 primary school children participated. Study revealed that large numbers of children (79.6%) were above 7 years old and only 20.4% were upto seven years old. A similar study undertaken by Abdullah and Maxood (2008) also described that majority (54.8%) of the children were above 7 years old and remaining proportion was less than 7 years old<sup>13</sup>.

As far as sex of the children is concerned, study disclosed that most of the children were male (73%). This is in contrast to the finding of study performed by

Umer and Umer (2011) who reported that majority (59%) of the children were female<sup>8</sup>.

Regular teeth cleaning with brush is more effective technique to keep the children away from dental caries. It was very encouraging that massive portion (89.5%) of children regularly brushed their teeth. The findings of our study are much better than the study carried out by Umer and Umer (2011) who asserted that just 24% children regularly brushed their teeth<sup>8</sup>.

The utilization of toothpaste is increasing swiftly among population owing to its usefulness. It was also observed during study that 98.0% children used toothpaste to clean their teeth. In a study Gupta and teammates (2013) pointed out that more than half (51.2%) of children cleaned their teeth with toothpaste<sup>14</sup>.

Pan/supari is not good for oral as well as physical health of children. It is important to mention that 57.3% primary school children did not use pan/supari but 42.7% children used daily or occasionally. Another study conducted by Dawani and coworkers (2012) demonstrated better results that massive portion (87.4%) of school children did not use pan/supari<sup>15</sup>.

During study much use of sweet and toffees was observed because 82.9% children used these items. Same results were also obtained through a study carried out by Dawani and associates (2012) who confirmed that 80% school children used sweet and toffee showing the attraction of children towards such products<sup>15</sup>.

Oral hygiene has a great importance and helps in protecting children from dental caries and oral diseases. It is worth mentioning here that major proportion (84.9%) of children had satisfactory oral hygiene. The results of the study performed by Rehman and fellows (2008) are comparable but showed better scenario who reported that 96.7% children in their study had satisfactory oral hygiene<sup>16</sup>.

Study showed very encouraging results that only 12.5% school going children had gingivitis but the study carried out by Sutthavong and Taebanpakul (2010) demonstrated very harmful situation that significant majority (95.5%) of primary school children had gingivitis<sup>17</sup>. It is appalling to note that 63.8 children in our study had staining of the teeth and 11.8% children had calculus deposits. The findings of our study are better than the study performed by Carneiro and Kabulwa (2012) who asserted that 56.9% children had calculus<sup>18</sup>.

When bleeding gums among children were observed, study indicated that 8.6% children had this problem. A study undertaken by Yusof and Jaafar (2013) showed discouraging results because the prevalence of bleeding gum was 31.4%<sup>19</sup>.

The prevalence of dental caries among primary school children was 61.8% which should be decreased despite some other studies also demonstrated almost same scenario. The results of our study are comparable but better than the study carried out by Vohra and assistants (2012) who elucidated that 67.1% school children had dental caries<sup>1</sup>.

During study relationship between dental caries and others factors was also assessed. Study disclosed that majority (55.3%) of school children who brushed teeth regularly had dental caries. The study undertaken by Vohra and assistants (2012) also elucidated that most of the children (64.6%) who regularly brushed teeth had dental caries.<sup>[1]</sup> Study further indicated that majority (55.3%) of school children who consumed sweet and toffees had dental caries. A similar study carried out by Rehman and collaborators (2008) reported that 26.6% children who consumed sweet and toffees had dental carries<sup>16</sup>.

## CONCLUSION

Study concluded that overall oral hygiene among children was satisfactory. A very little portion had gingivitis, calculus deposits and bleeding gums but staining of teeth was observed among majority. The prevalence of dental caries among school children was 61.8%. Majority of children who brushed their teeth regularly and consumed sweet/toffees had dental caries. Health education programs at school levels and further studies on large scale are required to be conducted to assess the determinants of dental caries among primary school going children.

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