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# Assessment of Demographic and Socioeconomic Factors Associated with Dental Caries in Children

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**Abstract** **Review Article**

***Background:*** Early childhood caries (ECC) is a prevalent and multifactorial condition that significantly affects children's health and quality of life, especially in low-resource settings. This study aims to assess the influence of demographic and socioeconomic factors on the prevalence of dental caries among children. ***Aim of the study:*** The aim of the study was to evaluate how demographic and socioeconomic variables influence the prevalence of dental caries in children. ***Methods:*** This cross-sectional study was conducted from March to June 2004 at the outpatient department of City Dental College and General Hospital, 1085/1 Malibagh Chowdhury Para, Dhaka-1219, Bangladesh. A total of 105 children under five with oro-dental problems were systematically selected. Data were collected through interviews and clinical examinations using standard dental instruments. Verbal consent was obtained. Data analysis was done with SPSS 11.0. ***Results:*** Among 105 children, 64.76% aged 3–5 had caries, with higher prevalence in males (45.71%) than females (25.71%). Caries was most common in children of illiterate mothers (36.19%) versus 5.71% for mothers with degrees. Most families (79%) earned under 10,000 Taka monthly. Only 5.71% brushed twice daily before bed and breakfast, while 34.28% brushed once or twice weekly, and 5.71% never brushed, linking socioeconomic and behavioral factors to caries. ***Conclusion:*** Demographic and socioeconomic factors, including maternal education, income, and oral hygiene habits, significantly influence the prevalence of dental caries in children.

**Key words:** Demographic Factors, Socioeconomic Factors, Dental Caries.

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## INTRODUCTION

Early childhood caries (ECC) stands as the most common chronic disease beginning early in childhood, with dental caries being the leading chronic condition among children aged 6 to 19 years [1,2]. This dental problem affects individuals of all ages but is particularly prevalent in children. Among preschoolers, the prevalence of dental caries ranges from 44.34% to 66.3% [3,4]. Maintaining healthy teeth is a crucial aspect of childhood health [5]. ECC negatively impacts child growth and development by contributing to poor nutrition, increased school absenteeism, and social anxiety, making it a significant public health concern in developing countries [6-8].

Dental caries is a complex, multifactorial disease influenced by the interplay of four primary factors: cariogenic bacteria, fermentable carbohydrates, a susceptible host (tooth structure and saliva), and sufficient time for these elements to interact. It begins with changes in the normal biofilm bacteria [9]. If left untreated, dental caries can cause pain, difficulty with daily activities such as chewing, self-esteem issues, aesthetic concerns, and sleep disturbances, all of which negatively affect oral health-related quality of life [10-

12]. In children, untreated caries may lead to infections, chewing problems, speech difficulties, and lowered self-confidence, ultimately reducing overall quality of life. The advanced stages of early childhood caries (ECC) are marked by significant destruction of tooth structure due to extensive demineralization of enamel, dentin, and root cementum [13].

Children make up about one-third of the population living in poverty, a factor strongly linked to higher rates of childhood caries [14]. Caries prevalence tends to be significantly greater among poorer and marginalized groups in both developed and developing nations, highlighting socioeconomic status as a key determinant of oral health [15,16]. Additionally, various sociodemographic and nutritional factors—including age, gender, nutritional status, and socioeconomic background—affect an individual's risk of developing caries [17]. Parental knowledge, skills, and attitudes toward oral hygiene play a pivotal role in establishing and maintaining children's oral health and hygiene practices [18]. The development and progression of early childhood caries (ECC) are influenced by a complex interaction of environmental, cultural, social, and economic factors [19,20].

Despite widespread recognition of ECC as a multifactorial disease with serious implications for child health, limited research in low-resource settings has explored the combined influence of demographic and socioeconomic factors on its prevalence. Existing studies often focus narrowly on clinical or behavioral aspects, overlooking how poverty, parental education, and living conditions intersect to shape oral health outcomes in children. This gap in context-specific evidence hinders the development of effective, targeted prevention strategies. The purpose of this study is to evaluate the influence of demographic and socioeconomic factors on the prevalence of dental caries among children.

**OBJECTIVE**

- To evaluate how demographic and socioeconomic factors influence the prevalence of dental caries in children.

## METHODOLOGY & MATERIALS

This descriptive cross-sectional study was conducted at the outpatient department of City Dental College and General Hospital, Malibagh Chowdhury Para, Dhaka, Bangladesh, from March to June 2004. A total of 105 children under five years of age presenting with oro-dental problems were systematically selected by including every fifth child attending the outpatient department until the sample size was reached.

Data were collected using a structured questionnaire and a clinical examination checklist developed based on the study objectives and variables. The questionnaire was initially prepared in English, translated into Bengali for interviews, and pre-tested among patients at Pioneer Dental College and Hospital, Dhaka, before finalization. The researcher conducted direct interviews with mothers to obtain demographic and socioeconomic information, followed by clinical oral examinations of the children. Verbal informed consent was obtained prior to data collection.

Clinical examinations were performed under good illumination using an electric dental unit equipped with dental light, mirror, curved and straight dental probes, tongue depressor, cotton, and antiseptic solution, with children seated on an electric dental chair. The oral cavity, dentition, and tonsils were inspected; carious teeth were identified by probing fissures or black marks, and missing and filled teeth were recorded.

Collected data were checked for completeness and consistency, entered into a computer, and analyzed using SPSS version 11.0. Descriptive and inferential statistics were applied as appropriate. The study followed ethical guidelines set by the Bangladesh Medical Research Council and the World Health Organization's ethical review committee, with participants provided study information in Bengali and verbal informed consent obtained, ensuring confidentiality and voluntary participation.

# RESULTS

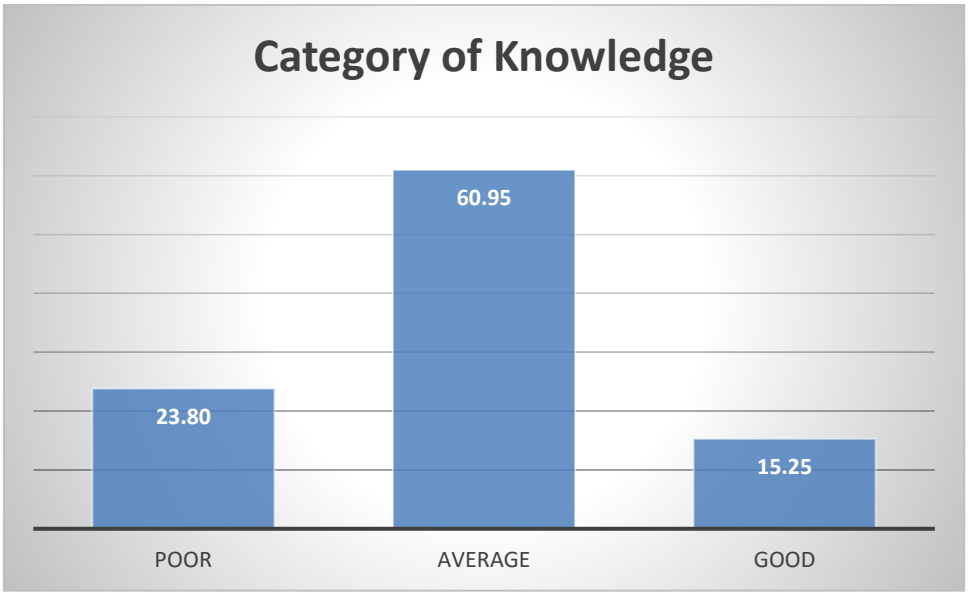


**Figure 1: Maternal Knowledge Regarding Dental Caries and Dental Care (n = 105)**

Figure 1 illustrates the distribution of maternal knowledge levels concerning dental caries and dental care practices. Among the mothers surveyed, 60.95% demonstrated average knowledge, 25% had poor knowledge, and only 15.25% showed good knowledge related to their child's oral health.

**Table 1: Distribution of Children by Age and Dental Caries (n = 105)**

| Age Group (years) | Number of Children with Dental Caries (n) | Percentage (%) |
|---|---|---|
| 2–3 | 15 | 14.28 |
| 3–5 | 68 | 64.76 |

Table 1 shows that dental caries were more prevalent among children aged 3 to 5 years (64.76%) compared to those aged 2 to 3 years (14.28%) attending the OPD of City Dental College and Hospital.

**Table 2: Distribution of Children by Sex and Dental Caries (n = 105)**

| Sex | Number of Children with Dental Caries (n) | Percentage (%) |
|---|---|---|
| Male | 48 | 45.71 |
| Female | 27 | 25.71 |

Table 2 shows the prevalence of dental caries among male and female children attending the OPD of City Dental College and Hospital. Male children had a higher prevalence (45.71%) compared to female children (25.71%).

**Table 3: Distribution of Children by Mother's Educational Status and Dental Caries (n = 105)**

| Mother's Educational Status | Number of Children with Dental Caries (n) | Percentage (%) |
|---|---|---|
| Illiterate | 38 | 36.19 |
| Primary | 20 | 19.05 |
| Secondary | 16 | 15.23 |
| S.S.C | 12 | 11.42 |
| H.S.C | 13 | 12.38 |
| Degree and above | 6 | 5.71 |

Table 3 shows the relationship between maternal education and dental caries in children attending the OPD of City Dental College and Hospital. Children of illiterate mothers had the highest prevalence of dental caries (36.19%), while those whose mothers had a degree or higher showed the lowest prevalence (5.71%).

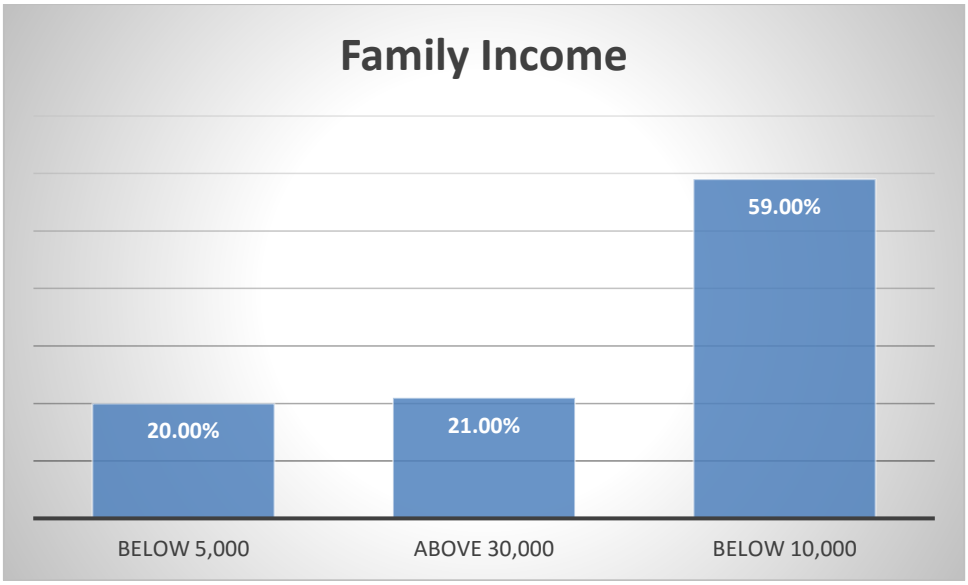


**Figure 2: Distribution of Family Monthly Income Among Study Participants (n = 105)**

Figure 2 illustrates the monthly family income distribution of the children attending the OPD of City Dental College and Hospital. Among the families, 20% had a net monthly income below 5,000 Taka, 59% had an income below 10,000 Taka, and 21% had an income above 30,000 Taka.

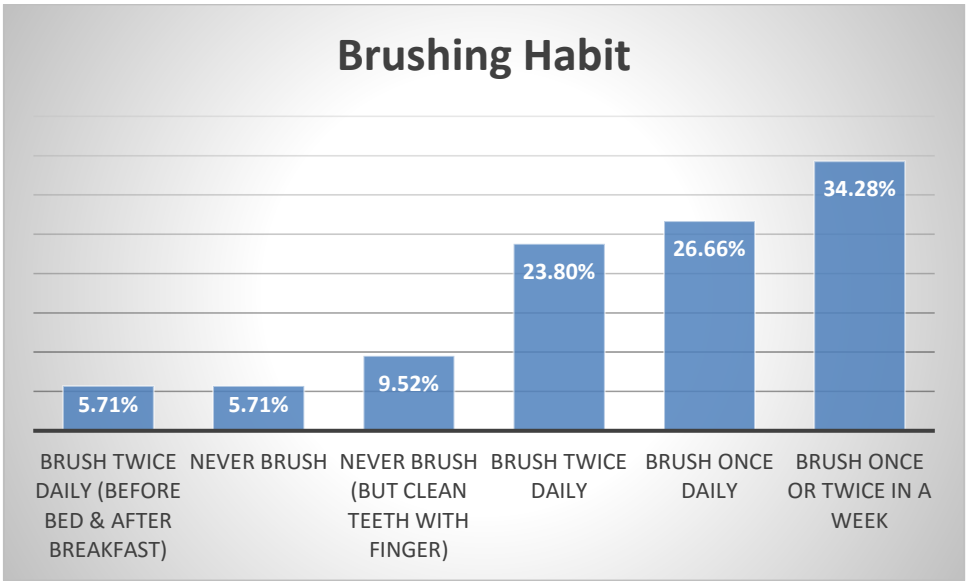


**Figure 3: Distribution of Brushing Habits Among Study Participants (n = 105)**

Figure 3 presents the brushing habits of children under five years of age attending the OPD of City Dental College and Hospital. Among them, 5.71% brush their teeth twice daily (before bed and after breakfast), 23.8% brush twice daily (unspecified), 26.66% brush once daily, 34.28% brush once or twice a week, 9.52% clean their teeth using fingers, and 5.71% never brush their teeth.

## DISCUSSION

This study highlights the prevalence and associated demographic and socioeconomic factors of dental caries among children under five attending a tertiary care dental hospital in Bangladesh. Dental caries, a multifactorial and largely preventable condition, remains a common yet neglected oral health issue in early childhood. The findings underscore the influence of age, maternal education, and household income on caries occurrence, reflecting underlying disparities in awareness, access to care, and preventive practices. The high burden of untreated caries observed in this study emphasizes the urgent need for targeted public health interventions and parental education to promote early prevention and reduce the long-term impact of childhood oral diseases.

In the present study, 60.95% of mothers exhibited average knowledge regarding dental caries and dental care, while 15.25% demonstrated good knowledge

and 23.80% had poor knowledge. This distribution reflects a moderate level of awareness among caregivers and underscores the influence of demographic and socioeconomic factors on maternal understanding. Similar findings were reported by Faruqui *et al.,*[21] in a cross-sectional study among 384 Bangladeshi mothers, where 62.5% had good knowledge, and maternal knowledge was significantly associated with education and socioeconomic status. Likewise, Tamannur *et al.,*[22] found that among 400 mothers of children aged 5–9 years, 41.3% had good knowledge, while 18.5% had poor knowledge, with both education and family income playing a significant role. The alignment of our results with these studies supports the notion that maternal knowledge—an important determinant of children's oral health practices—is closely linked to broader sociodemographic conditions, reinforcing the need for targeted oral health education interventions in low-income and less-educated populations.

The present study revealed that dental caries was markedly more prevalent among children aged 3–5 years (64.76%) compared to those aged 2–3 years (14.28%), indicating an age-related increase in caries occurrence. This pattern aligns closely with the findings of Guan *et al.,*[23], who reported a 63.1% prevalence among 3–5-year-olds, and Liu *et al.,*[24], who observed a 74.3% prevalence in the same age group. Both studies emphasize the role of increasing age as a significant determinant of dental caries, likely due to prolonged exposure to cariogenic foods, inadequate oral hygiene practices, and evolving dietary habits. Similar to their observations, our study suggests that older preschool children are at heightened risk of caries development, underscoring the importance of early preventive interventions targeting this vulnerable age group.

In this study, male children exhibited a higher prevalence of dental caries (45.71%) compared to females (25.71%), suggesting a possible influence of sex as a demographic factor in the development of caries. This finding aligns with Acuña CJE *et al.,*[25], who observed that 53.9% of affected children were male versus 46.1% female in their cohort of 1–5-year-old children. The consistent pattern across studies may be explained by behavioral differences, such as boys being more prone to cariogenic diets, irregular oral hygiene habits, or less parental supervision. These results underscore the importance of considering child sex as a relevant demographic variable in designing oral health interventions, especially in resource-limited or socioeconomically challenged settings where preventive care may not be equitably distributed.

The findings of this study demonstrate a clear inverse relationship between maternal educational status and the prevalence of dental caries in children, with the highest caries rates observed among children of illiterate mothers (36.19%) and the lowest among those whose mothers held a degree or higher (5.71%). This pattern aligns closely with the results reported by Nembhwani *et al.,*[26], who found that higher maternal education was significantly associated with lower DMFT scores in children, indicating fewer caries, while children of mothers with no formal education experienced a significantly higher caries burden. Similarly, Traebert *et al.,*[27] observed that among children aged 3–5 years, those whose mothers had eight or fewer years of schooling exhibited a significantly greater prevalence of severe early childhood caries and overall carious lesions. Both studies highlight maternal education as a strong predictor of caries severity in early childhood, reinforcing the critical role of maternal literacy and education in influencing children's oral health outcomes. These consistent findings underscore the importance of targeting educational interventions and oral health promotion efforts towards mothers with lower educational attainment to effectively reduce the burden of dental caries in children.

The distribution of family income among the children in this study, with 20% of families earning below 5,000 Taka, 59% below 10,000 Taka, and 21% above 30,000 Taka, reflects significant socioeconomic disparities that likely influence the prevalence of dental caries. This aligns with findings from Fleming *et al.,*[28], who reported that dental caries prevalence decreases as family income rises; specifically, children from families below the federal poverty level had a caries prevalence of 56.3%, which dropped to 34.8% among those from families with incomes exceeding 300% of the poverty level. Similarly, untreated dental caries showed a marked decline with increasing income levels. These parallels emphasize the critical role of family income as a determinant of childhood oral health, underscoring the importance of addressing economic inequalities to reduce the burden of dental caries among disadvantaged populations.

The brushing habits observed in this study among children under five years of age indicate that only a small proportion, 5.71%, brush their teeth twice daily before bed and after breakfast, while an additional 23.8% brush twice daily without specified timing. A notable percentage of children brush once daily (26.66%), brush infrequently once or twice a week (34.28%), clean their teeth using fingers (9.52%), or never brush at all (5.71%). These findings align with Boustedt *et al.,*[29], who reported that caries prevalence at age five was significantly associated with brushing less than twice daily during the preschool years. The low frequency of twice-daily brushing in this population suggests a potential risk factor for early childhood caries, emphasizing the critical role of health professionals in educating and supporting parents to establish effective tooth brushing routines during early childhood to mitigate caries risk.

**Limitations of the study**

The study had several limitations:

- The study was conducted only at City Dental College and General Hospital, Dhaka, which may not represent the overall situation in the country.
- The sample size was not sufficient to fully capture the actual prevalence and frequency of dental caries.
- Some parents were reluctant to participate fully, potentially leading to underreporting or inaccurate representation of their knowledge, attitudes, and practices.
- Limited literature was available on this specific topic, restricting comparison and contextualization of findings.

## CONCLUSION

This study highlights that demographic and socioeconomic factors play a crucial role in the prevalence of dental caries among children. Older children and males showed higher rates of caries, while children of less-educated mothers were more affected compared to those whose mothers had higher education. Most families had low-income levels, and inadequate oral hygiene practices were common, with few children brushing regularly. These results emphasize the importance of addressing educational, economic, and behavioral factors through targeted interventions to effectively reduce dental caries in children.

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