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Original Research Article

Oral health related disorder among children with behavioral problems

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ABSTRACT

Background: The best mouth function, the absence of disease, and oral health are achieved by maintaining the highest self-esteem possible. When someone has good dental health, they can communicate and connect with people without getting sick, feeling uncomfortable, or feeling embarrassed. This study aimed to evaluate the Oral health-related disorder specifically to assess dental caries and gingivitis among children with behavioral problems.
Methods: This study was a prospective cross-sectional investigation carried out at Kalachandpur Government Primary School and Jashim Uddin Institute, Dhaka. The study was carried out between October 2021 and December 2022 and included 650 pediatric patients who were aged between 6 to 15 years.
Results: Most 290 (44.62%) children were aged 6-9 years, 250 (38.46%) were 10-12 years, and the rest 110 (16.92%) were 13-15 years old. Patients with 11-15 years had lower dental caries. 310 (48%) were female, and 340 (52%) were male. Dental caries is associated with elevated risk. Children in the elevated caries risk group had a significantly higher mean value of conduct problems and Hyperactivity/inattention based on the SDQ compared to those with low caries risk. No statistically significant differences were found between the low caries risk group and the elevated caries group for the other subscales.
Conclusions: There were statistically more children in the study group who had a high risk of getting caries. Behavior problems were observed while externalizing children who had a high risk of getting caries. Children with externalizing behavior also have more conduct problems and hyperactivity compared to children with reduced caries risk.

Keywords: Oral health, Dental caries, Gingivitis, Behavioral problem, Hyperactivity

INTRODUCTION

The best mouth function, the absence of disease, and oral health are achieved by maintaining the highest self-esteem possible.[1] When someone has good dental health, they can communicate and connect with people without getting sick, feeling uncomfortable, or feeling embarrassed. Despite considerable improvements, there are still severe health challenges in many communities and groups, especially for children who are poor and socially marginalized.[2] The high incidence of oral sickness worldwide results in several public health challenges, including discomfort, functional impairment, and diminished quality of life.[3] Historically, the most significant global health burdens have been thought to be gingival and dental disorders.[4] Dental care is defined as a disease of the teeth in which the teeth' enamel, dentin, and cementum get demineralized, eventually resulting in

cavitations. It is particularly prevalent among youngsters and is still a significant public health issue on a global scale.[5] It negatively affects children's quality of life since it causes discomfort, early tooth loss, malnutrition, and other issues with growth and development.[6] Children with poor dental health are 12 times more likely than those without restricted exercise days.[7] In addition to being the most researched oral illness worldwide, dental caries is one of Bangladesh's main issues with oral health. It has been called a social disease and has a multifactorial origin. Its incidence is influenced by biological, nutritional, behavioral, socioeconomic, and access-related factors for durable goods and medical care.[8] Children's oral health has been linked to the socioeconomic status of their parents. Federal surveys in the US revealed disparities in children's oral health and access to dental clinics for cavity treatment; 60% more untreated dental cases were among the low-income group compared to those in the high-income group.[9] Poor parental education and employment status are also linked to their children's poor health.[10] Children in wealthy countries have more frequently been diagnosed with externalizing behavioral issues.[11,12] Attention-deficit hyperactivity disorder (ADHD), temperament, impulsivity, and general conduct issues are examples of externalizing behavioral matters.[13] There is evidence linking externalizing childhood behavioral issues with tooth caries. Children with active caries had externalizing behavior problems that were considerably more common than children without active caries, according to research by Williamson et al.[14] Adolescents with ADHD have been found to endure more dental caries than typically developing children despite claims to the contrary in other studies.[15-17]

Objective of the study

This study aimed to evaluate the oral health-related disorder specifically to assess dental caries and gingivitis among children with behavioral problems.

METHODS

This study was a prospective cross-sectional investigation carried out at Kalachandpur Government Primary School and Jashim Uddin Institute, Dhaka. The study was carried out from October 2021 to December 2022. In this study we included 650 pediatric patients who were aged between 6 to15 years and patients with any history acute illness (e.g., renal or pancreatic diseases, and ischemic heart disease) were excluded from our study. The school authority permitted student participation, and parents' written concern was taken through a written consent form. Externalizing behavior problems in children were scored by combining the 'hyperactivity-inattention' and 'conduct problems' emotions, peer, and pro-social questionnaire (SDQ), translated into Bengali.[18] This brief questionnaire has proven valuable in measuring psychosocial adjustment in children and adolescents. Children were grouped with elevated, high-risk, and low-risk scores for hyperactivity-inattention and conduct problems. A parental-administered questionnaire was used to collect information about socio-demographic variables, such as the child's date of birth, gender, and the mother's highest completed level of education. There were three categories of educational status: illiterate or primary, secondary education, and higher education (higher vocational education or university). The data were statistically analyzed using statistical package for the social sciences (SPSS) version 25.

RESULTS

Figure 1 shows the age distribution of the study patients where most 290 (44.62) children were aged between 6-9 years, 250 (38.46%) were 10-12 years, and the rest 110 (16.92), were 13-15 years old. Patients with 11-15 years had lower dental caries, which is statistically significant**.**

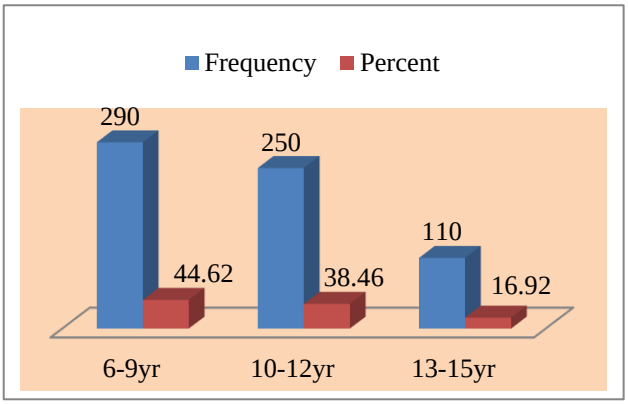

Figure 1: Age distribution of the study patients.

Figure 2 revealed the gender distribution of the children, where 310 (48%) were female, and 340 (52%) were male. There were no significant differences between males and females.

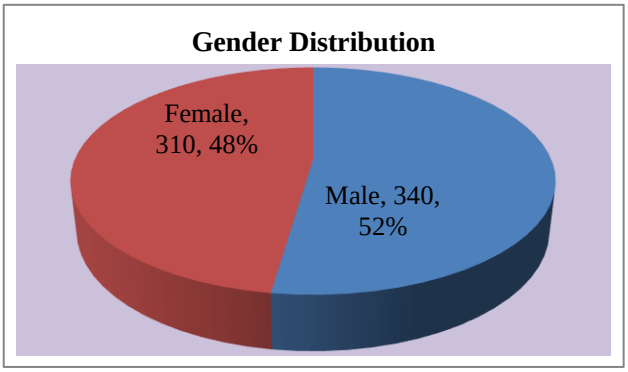

Figure 2: Gender distribution of the study patients.

Figure 3 explains the education level of the patient's mother. Most 365 (56.15) mother were primary or illiterate, followed by 180 (27.69%) were secondary and 105 (16.15%) were higher educated. Most of the patient's mother's education level was primary or illiterate, and their

prevalence of dental caries was higher than that of the secondary and higher-educated mothers.

Table 1 shows the study patients according to G.V Black's caries classification. Most 197 (30.3%) children were affected by class-I caries and followed by 142 (21.8%) were affected by class II, 110 (16.9%) were affected by class III, 78 (12%) were affected by class IV, 65 (10%) were affected by class V, and 58 (8.9%) were affected by class VI caries.

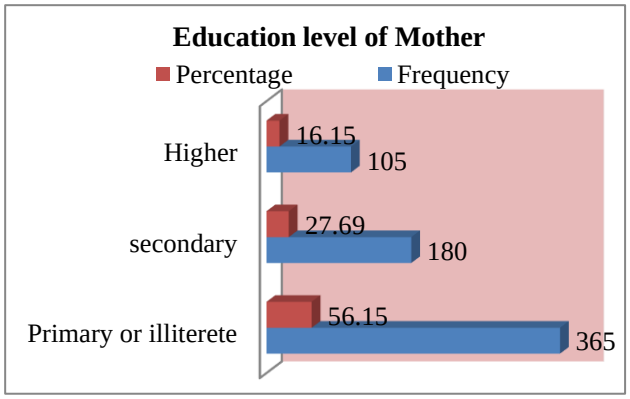

Figure 3: Education level of the study patient's mother.

Table 2 explains the distribution of study patients according to gingivitis classification where 186 (28.6%) had healthy gingival and followed by 372 (57.2%) had mild, 77 (11.8%) had moderate, and 15 (2.3%) had severe gingivitis.

Table 3 revealed the age and gender distribution of the study patients according to low, intermediate, and high caries risk groups and the elevated caries risk group. There were 138 (67.4%) children in the low caries-risk group, 136 (20.9%) children in the intermediate group, and 76 (11.7%) children in the high-risk group. The intermediate and high-risk groups were merged and formed the elevated caries risk group, consisting of 212 (32.6%) subjects. There were statistically significantly more children with elevated caries risk in the study group compared to the low caries risk group.

Table 1: Distribution of study patients according to G.V Black's caries classification.

G.V Black's classification	Frequency	Percentage
Class I	197	30.3
Class II	142	21.8
Class III	110	16.9
Class IV	78	12.0
Class V	65	10.0
Class VI	58	8.9

Table 2: Distribution of study patients according to gingivitis classification.

Variable	Frequency	Percentage
Healthy gingiva	186	28.6
Mild gingivitis	372	57.2
Moderate gingivitis	77	11.8
Severe gingivitis	15	2.3

Table 3: Age and gender distribution of the study patients according to low, intermediate and high caries risk groups, and the elevated caries risk group.

Variable	Low caries risk (%)	Intermediate caries risk (%)	High caries risk (%)	Elevated caries risk (%)	Total
Age					
6-9	177 (61)	80 (27.6)	33 (11.4)	113 (39)	290
10-12	169 (67.6)	46 (18.4)	35 (14)	81 (32.4)	250
13-15	92 (83.6)	10 (9.1)	8 (7.3)	18 (16.4)	110
Gender					
Male	226 (66.5)	66 (19.4)	48 (14.1)	114 (33.5)	340
Female	212 (68.4)	70 (22.6)	28 (9)	98 (31.6)	310
Total	438 (67.4)	136 (20.9)	76 (11.7)	212 (32.6)	650

Table 4: Factor associated with dental caries and externalizing behavioral problem using strengths and difficulties questionnaire for parents (SDQ) subscale.

SDQ parent	Low risk, mean (SD)	Elevated risk, mean (SD)	P value
Emotion	3.63 (2.34)	4.22 (2.90)	n/s
Hyperactivity/ inattention	5.41 (2.37)	6.22 (2.65)	0.045
Peer	2.71 (2.44)	2.82 (1.89)	n/s
CD	4.02 (1.40)	4.99 (1.88)	0.038
Pro social	6.55 (2.11)	6.54 (2.44)	n/s

Table 4 explains factors associated with dental caries and externalizing behavioral problems using the strengths and difficulties questionnaire for parents (SDQ) subscale. Dental caries is associated with elevated risk (i.e., emotion, hyperactivity–inattention, conduct disorder (CD), peer problems, and pro-social behavior (generosity and thoughtfulness). Children in the elevated caries risk group had a significantly higher mean value of conduct problems and hyperactivity/inattention based on the SDQ compared to those with low caries risk. No statistically significant differences were found between the low caries risk group and the elevated caries group for the other subscales (i.e., emotional problems, peer problems, and pro-social behavior).

DISCUSSION

Children and adolescents with externalizing behavior about oral health, oral health behavior, and parental assessments of their child's oral health and experiences with dental treatment have been the main subjects of this study. Most of the study's participants were from low socioeconomic backgrounds and reported poor oral health behaviors such as inconsistent dental appointments and unsatisfactory tooth brushing routines. However, the current study's findings are consistent with those of several other research, which revealed that fluoride use and reported brushing frequency are linked to improved general oral health and a reduction in dental caries.[19-21] The validity of the SDQ is supported by the study's conclusion that it is significantly associated in the predicted direction with disruptive behavior disorder (DBD). The available normative data place the findings of this study in a broader context, demonstrating that the study group exhibits externalizing behavioral issues and that there are significant disparities among these kids when categorized according to caries risk.[22] Children with externalizing behavior difficulties have a higher risk of developing cavities, which can partially be attributed to their behavioral traits. Routine tasks like eating regularly and cleaning their teeth may be challenging for kids who are more impulsive and engage in problem behavior. It can be challenging for young kids to maintain good oral hygiene, which demands determination, patience, and consistency. This study has demonstrated that there are oral health disparities between children and adolescents that exhibit externalizing behavior. It was also discovered that there were variances in the prevalence of dental caries depending on age groups, with dental caries decreasing with age. However, among children who were externalizing, more kids had a high risk of developing cavities. Behavioral differences were seen in externalizing kids with more significant mean conduct problems, impulsivity/hyperactivity scores, and a higher risk of tooth decay. Regarding the parental assessment of the child's dental health, there were no differences among the children who exhibited externalizing behavior. There was no statistically significant difference in the prevalence of caries in children with externalizing behavior, but the risk of caries was higher. The child's dental development may have anything to do with this finding. Therefore, caries may not have yet manifested. Preventive care provided by the dental team or the family at home is another aspect to consider. This is consistent with the findings of Williamson et al who discovered that kids with externalizing behavior were more susceptible to caries, which could be explained by the fact that these kids hadn't gotten enough preventive care.[23] However, the current findings differ from those of Lorber et al who discovered that children exhibiting externalizing behavior had reduced dental decay.[24] Conduct issues and impulsivity/hyperactivity exhibited higher mean values in children who externalized and had a higher risk of developing cavities. Therefore, it is beneficial to include these elements in the caries risk assessment. Less disagreement was observed in the households of children externalized with a higher risk of developing caries, which may indicate that these parents are less strict about upholding good dental hygiene practices. Children with externalizing behavioral issues washed their teeth significantly less frequently than other kids. A proven preventive strategy for dental caries is brushing twice a day with fluoride toothpaste.[25] Maintaining good oral hygiene can be challenging for children who are impulsive or hyperactive, since it involves determination, patience, and consistency. The youngster may not obey their parents' commands, be too fatigued to remember to wash their teeth, lack motivation, or have trouble understanding the repercussions of their behavior. More than half of the parents of children with hyperactivity disorder reported having trouble maintaining good oral hygiene and tooth brushing during childhood. Blomqvist et al revealed that tooth brushing less than twice a day is ordinary among children 13 years of age and younger with hyperactivity disorder.[26] The child's symptoms of hyperactivity and conduct behavior may be the cause of this. The significant amount of plaque in children with hyperactivity disorder is consistent with other research findings.[27-30] The desire for sweetened beverages, soft drinks, and juices is a common risk factor in children with externalizing behavior and hyperactivity. The data above look relevant in consideration of Blomqvist et al's findings.[26] The parents' candid responses to the open-ended questions show that they know their child's love of sweets. This risk factor should be addressed in the anamnesis, and parents should be encouraged to limit their consumption of sweets, soft drinks, snacks, and pastries by advocating non-cariogenic alternatives. As a result, entries about sweets in dental records serve as a crucial reminder that a caries-risk assessment should be carried out at every appointment to evaluate changes in a person's risk status. Since externalizing impulsive behavior may be linked to a propensity for caries, it's critical to spot these groups of kids early on. Impulsive and disruptive youngsters who receive dental care develop issues controlling their behavior and, over time, develop dental phobia. According to a prior study, externalizing children are challenging to treat.[31]

Limitations

This study has some limitations because of short study period and limited resources. After evaluating once those children we did not follow-up them for a long term and have not known other possible interference that may happen in the long term with these children.

CONCLUSION

There were statistically more children in the study group who had a high risk of getting caries. Behavior problems were observed while externalizing children who had a high risk of getting caries. Children with externalizing behavior also have more conduct problems and hyperactivity compared to children with reduced caries risk.

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