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RESEARCH ARTICLE

DENTAL CARIES PREVALENCE AMONG SCHOOL-GOING CHILDREN OF RURAL AREAS OF JAMMU

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ABSTRACT

Background: Dental caries is considered as the most common chronic disease of childhood that interferes with normal nutrition intake, speech, and daily routine activities. Dental caries afflict humans of all ages with the highest priority risk group being schoolchildren. Thus, a cross-sectional study was conducted with the aim to assess the prevalence of dental caries among 6-8 year old school-going children of Poonch district of Jammu and Kashmir. **Methods:** 400 study subjects were selected based on simple random sampling technique Demographic information such as name, age, gender, and class was collected followed by clinical examination for dental caries using DMFT/dmft index. Descriptive and inferential statistical analyses have been carried out. Chi-square test was used to analyse gender differences and mean DMFT/dmft index scores. **Results:** The study sample comprised of 400 school children with 247 males and 153 were females. The DMFT scores ranged from 0-6, with the mean DMFT score of 2.49 ± 1.10 with the prevalence of decayed teeth being more in males. **Conclusions:** Dental caries were found both in primary dentition and permanent dentition. The study reveals that dental caries still remains as a major oral health problem among school children.

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INTRODUCTION

Oral health that refers to the health of oral and related tissues is presently recognised as an essential and integral component of overall health. It enables an individual to eat, speak and socialize without active disease, discomfort or embarrassment and thus contributes to general well-being (Baghdadi, 2015). An individual cannot be truly considered as healthy unless he or she is free from the burden of oral and craniofacial diseases and conditions. Oral diseases are referred to as silent epidemic and are still progressing despite the exponential growth in understanding of the causes and treatment of diseases (US, 2000). Children suffering from poor oral health are twelve times more likely to have more restricted-activity days and more than 50 million hours annually are lost from school (Kwan, 2005). Dental caries remained the single most common chronic childhood disease which is five times more common than asthma and seven times more common than hay fever (http://child.nohp.org.in//About_us1/WakeUpCallAction.aspx (accessed on 27.07. 2017).). It is defined as an irreversible microbial disease of the calcified tissues of the teeth,

characterized by demineralization of the inorganic portion and destruction of the organic substance of the tooth, which often leads to cavitation (Karunakaran, 2014). Tooth decay is considered to be the major public health problem affecting children in both industrialised and developing countries causing impaired chewing, decreased appetite, weight loss, sleep problems, behavioural changes, and low school performance (Piovesan *et al.*, 2009). Global burden of disease 2010 data revealed that untreated caries in permanent teeth was the most prevalent condition, whereas severe periodontitis and untreated caries in deciduous teeth were the sixth and tenth most prevalent conditions, affecting 35%, 11% and 9% of the global population respectively (Marcenes *et al.*, 2013). However, in National Health Survey conducted throughout India the prevalence of dental caries was 51.9% in 5 year-old children, 53.8% in 12 year-old children and 63.1% in 15 year old teenagers (Bali *et al.*, 2004). Despite many advances in the urban area, the rural population is still lacking its basic access to oral health care due to a shortage of dental manpower, financial constraints and the lack of perceived need for dental care among rural masses. From the available literature, no data was available for Poonch district of Jammu region. In this study, an attempt has been made to assess the dental caries prevalence among 6 to 8 year-old school going children in Poonch district of Jammu region.

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Schools can provide a supportive environment for promoting oral health and can be extremely helpful in spreading the right message to local community.

MATERIALS AND METHODS

A cross-sectional study was carried out in Poonch district of Jammu Division of Jammu and Kashmir State, India. A simple random sampling technique was employed to select the schools. Based on the prevalence of dental caries, the final sample size estimation was done. It was determined using sample size calculation formula

$$n = (Z_{\alpha/2})^2 * P * (1-P) * D / E^2$$

where n = number of participants

P = prevalence / proportion (it was taken as 50%)

D = design effect. This is taken as 1.

E = error

$Z_{\alpha/2}$ = confidence interval

If, p = 50% = 0.50

E = 10% P = 0.10 x 0.50 = 0.05

According to the above given formula, the final sample size was:

$$n = \frac{(1.96)^2 \times 0.5 \times (1 - 0.5) \times 1}{(0.05)^2} = 384$$

Considering non-response rate and sample loss due to attrition, minimum sample size needed would be n=400. Prior ethical clearance was taken from the concerned authorities after providing a thorough explanation of the study protocol. Data was collected from 5 government schools who gave permission to conduct the study. Study was conducted over a period of 2 week in the month of July 2019. All students who gave consent and were available at the time of study and who fulfilled the inclusion criteria were included in the study.

Inclusion criteria

- School children aged 6-8 years (both male and female).
- Cooperative Children

Exclusion criteria

- Uncooperative children
- Those suffering from acute infections in the oral cavity (based on oral visual examination).
- Those who are having any chronic systemic illness.
- Children who are undergoing fixed or removable orthodontic treatment.

The clinical examination was done using WHO type III method involves inspection of the oral cavity and recording dental caries using dmft/ DMFT (decayed, missing/extracted and filled teeth) index (World Health Organization, 1997).

Statistical analysis: Descriptive and inferential statistical analysis has been carried out in the present study. Frequency distribution of subjects as per their responses to each question was expressed in absolute number and percentage.

Significance was assessed at 5 % level of significance. Chi-square test was used to analyse gender differences and mean deft scores. Data was entered in Microsoft excel and analysed using SPSS (Statistical Package for Social Science) 21 package.

RESULTS

Schools are the best centre for effectively implementing the comprehensive health care programme as children are easily accessible at school (Kwan, 2005). Thus, an attempt has been made in the present study to evaluate the prevalence of dental caries among school-going children of Poonch city, since negligible literature was reported in past. The study sample comprised of 400 school children out of which 247 (61.25%) were boys and 153 (38.25%) were girls (Figure 1).

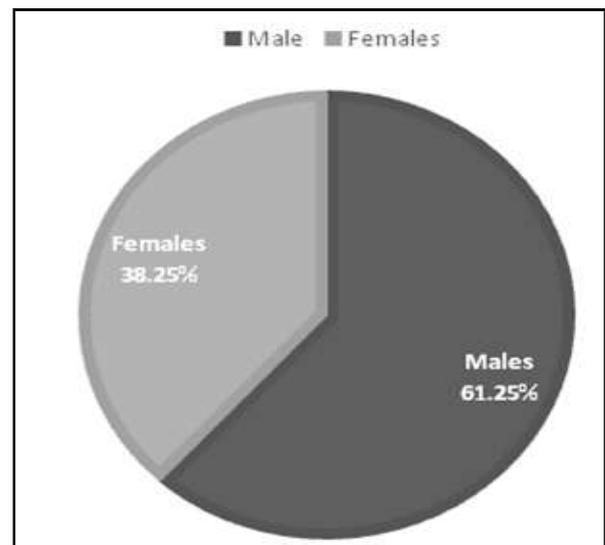


Figure 1. Gender-wise distribution of the study subjects

The overall prevalence of dental caries was 72.6%. According to frequency distribution of DMFT/dmft components among study subjects it was seen that the overall prevalence of decayed component was 62.2% with boys having higher percentage of decayed teeth i.e. 65.6% as compared to girls i.e. 56.8%. Out of total 400 children, 47 children had teeth missing due to caries while 39 children had filled teeth (Table 1). Regarding the distribution of total mean DMFT/dmft scores and its individual components among study participants it was found that the mean deft scores were 2.49 ± 1.10 . The component-wise mean scores of decayed, missing and filled teeth was 4.53 ± 1.40 , 1.34 ± 0.87 and 1.34 ± 0.87 respectively. It was also observed that the girls had overall lower mean scores as compared to boys (Table 2)

DISCUSSION

Dental caries is one of the most prevalent chronic diseases of people worldwide and individuals of all ages are susceptible to it, is found in approximately 90% of school children. The disease being most prevalent in Asian and Latin American countries (Tasneem *et al.*, 2016). Despite the incredible scientific advances and the fact that caries is preventable, the disease continues to be a major public health problem. The World Health Organization (WHO) has ranked dental caries, as number three among all

Table 1- Frequency distribution of the study subjects according to number of DMFT/dmft components

Gender	Total no. of children n (%)	No. of children with decayed teeth	No. of children with missing teeth	No. of children with filled teeth
Male	247 (61.75%)	162 (65.6%)	37 (14.9)	18 (7.3)
Female	153(38.25%)	87 (56.8%)	12 (7.84)	21 (13.7)
Total	400	249 (62.2%)	47(11.75%)	39 (9.75)

Table 2. Distribution of mean DMFT/dmft scores and its components among study participants

Variables	Males Mean \pm SD	Female Mean \pm SD	Total Mean \pm SD	p-value
Decayed (D/d)	4.89 \pm 1.52	4.18 \pm 1.29	4.53 \pm 1.40	0.05*
Missing (M/m)	1.62 \pm 1.36	1.07 \pm 0.38	1.34 \pm 0.87	0.90
Filled (F/f)	1.83 \pm 1.15	1.39 \pm 0.96	1.61 \pm 1.05	0.34
Mean scores	2.78 \pm 1.34	2.21 \pm 0.87	2.49 \pm 1.10	0.04*

*-Statistically significant

chronic non-communicable diseases that require worldwide attention for prevention and treatment (Prabakar, 2016). Schools can provide a supportive environment for promoting oral health and can be extremely helpful in spreading the right message to local community thus, the present study was conducted among 6-8 year old school children. Regarding gender-wise distribution of dental caries, it was found that to be more prevalent among boys than girls. This could be due to early eruption and longer retention of these teeth among boys. These findings were consistent with those of Sarvanan *et al* and Bhardwaj *et al.* (Saravanan, 2005; Bhardwaj, 2012). Out of the three components -decayed, missing and filled the decayed component constituted the major part. This untreated tooth decay reflected a low utilization of preventive and curative dental services even where it is available, probably as a result of lack of knowledge, awareness and the financial constraints amongst rural population. The prevalence of dental caries was found to be 72.6%. These results were in line with studies conducted by Rao *et al*, Pai NG *et al.* (Rao, 1999; Pai, *et al.*, 2018). However, lower prevalences of 25% and 45.4% were found in study conducted By Tasneem *et al.* (2016) and Behal *et al.* (2016)

Mean scores of dental caries: In the present study, it was noted that the DMFT scores ranged from 0-6, with the mean DMFT score of 2.49 \pm 1.10, with the higher expressivity of decayed component. The mean scores for decayed, missing and filled component were 4.53 \pm 1.40, 1.34 \pm 0.87 and 1.61 \pm 1.05 respectively. This could be attributed to the reason that awareness regarding tooth decay among people have increased over years and majority of the participants were brushing their teeth daily once with fluoridated dentifrices, and were following healthy oral hygiene practices. Our study results were in line with the fluoride mapping study conducted in in India in the year 2002-2003; where the mean DMFT index for was 1.8-2.4 (Bali, 2004). However, in a study conducted in Chennai by Roshan *et al*, the mean scores were 2.27 \pm 0.4 (Prabakar, 2016). While in study conducted in Budgam district of Jammu and Kashmir state the mean scores were 1.35 \pm 1.79 for primary dentition and 1.74 \pm 1.92 for permanent dentition (Shah *et al.*, 2015). The mean scores were in 4.09 \pm 5.32 in a study conducted in Srinagar city (Behal *et al.*, 2016). In an Iraqi study the mean scores in rural areas were in Behal 4.39 \pm 2.52 (Abbas, 2018). Children in the mixed dentition stage are prone to poor oral hygiene, this period of child's age is critical from the point of the view of the normal development of occlusion and preservation of first molars from dental caries.

Schools are a powerful setting for secondary socialisation for children and majority of their lifetime during which lifelong sustainable health related behaviours, as well as beliefs and attitudes, are developed is spent here (Jürgensen, 2012). Thus, schools may serve as an effective platform for promotion of oral health and oral health related topics should be included in the school curriculum as children are very receptive during this period. As a preventive strategy, regular oral health check-ups should be conducted in school for early diagnosis and treatment of cases and pit and fissure sealant application and topical fluoride application could also be considered for prevention of dental caries.

Conclusion

The present study concluded that there is high prevalence of dental caries with more boys affected than girls. As a preventive strategy, there is a need to implement health education program for maintaining good oral hygiene. Further epidemiological studies should be conducted to help in the assessment of the need for planning of oral health services or organization of public health intervention programs.

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