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## DENTAL CARIES AND MALNUTRITION IN CHILDREN BELOW AGE OF FIVE



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### Short Profile

Anil Gupta is a Reader at Department Of Biochemistry in Eklavya Dental College & Hospital, Kotputli, Rajasthan.



### ABSTRACT:

Prospective and cross sectional study was conducted in city, Fazilka, Punjab. It covered a sample of 440 children under age of five years. Sample selected by random multi stage sampling method. Selection done from schools, anganwadi and slum areas. It was found that dental caries affected 11.6% ( 51/440) of children. Dental caries were significantly, (  $p<0.001$  ), associated with malnutrition in children.

### KEYWORDS

*Malnourishment, Dental caries, Wasting, Under-weight.*

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## INTRODUCTION

Oral and general health of an individual go hand in glove relationship. Apart from environmental, genetical factors, health is appreciably dependent on nutrition (Edalat et al., 2014). Balanced diet is necessary for growth and development of body organs in formative years of life. Nature of food effects the health of teeth. Today, dietary habits are in transition phase. Children as well as adults are adopting new dietary habits. Fast food, snacks, wafers, soft drinks predominate the traditional foods in offices, schools and homes. Children are prone to dental caries and malnutrition (Weinstein et al., 1996).

Dental caries in toddlers are described as early childhood caries. These may be defined as the presence of one or more than tooth with dental caries (with or without cavity)/ missing (caused by caries), or filled tooth surface in any primary tooth in a pre-school age child (71 months or younger) (Casamassimo et al., 2005).

The duration of dental caries in children definitely, has the same effect as any other systemic disease/infection on the children growth and development. (Mohammadi et al., 2012).

## RATIONALE

Dental caries is a microbial origin dental disease affecting teeth of children.

Prevalence of dental caries and its association with different categories of malnourishment in children is minimally worked out, both at national & regional level in india.

## AIM & OBJECTIVES

### Aim

The study was focused to find out the prevalence of dental caries and its association with malnourishment in children.

### Objectives

1. To assess overall prevalence of dental caries in children.
2. To assess its association with different categories of malnourishment in children.

## MATERIALS & METHODS

### Research Design

Descriptive and Cross sectional study design.

### Study Area

Study was conducted in and around the city of Fazilka in Punjab. This city is located on Indo-Pak

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border in Punjab.

### Sample Source and Sampling Units

Children below the age of five years, residing in and around Fazilka, Punjab, according to the inclusion and exclusion criteria, constituted the sample source and sampling units.

### Sample Selection Criteria

#### Inclusion Criteria

1. Children between 2 years to below the age of 5 years.
2. All the children who were physically fit so as to co-operate in the study.

#### Exclusion Criteria

1. Children who were critically ill.
2. The children who were crying and agitated, did not participate in examination.

### Dental examination

Dental examination was carried out by using mouth mirror and probe in day light. Children were sitted on ordinary chair. Caries were recorded by deft index (Greubbell, 1944).

### Early childhood caries

ECC was defined by using AAPD criteria (AAPD, 2008).

the presence of one or more than tooth with dental caries (with or without cavity)/ missing (caused by caries), or filled tooth surface in any primary tooth in a pre-school age child (71 months or younger).

### Anthropometric measurements

#### Height measurement

Height of children were measured using a vertical wooden height board by placing the child on the measuring board, child standing upright in the middle of board his head, shoulders, buttocks, knees and heels touching the board.

#### Weight measurement

Weight was measured by electronic digital weight scale with light clothing and no shoes.

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## DENTAL CARIES AND MALNUTRITION IN CHILDREN BELOW AGE OF FIVE

Calibration was done before weighing every child by setting it to zero.

### Statistical Design

#### Descriptive study

Dental caries was taken as dependent variable & malnutrition was considered as independent variable.

Variables were described in prevalence mode.

(Prevalence of a variable) = number of participants affected / total number of participants  $\times 100$

Inference was deduced by Chi square test for independence.

(p) value of  $< 0.05$  taken as statistically significant.

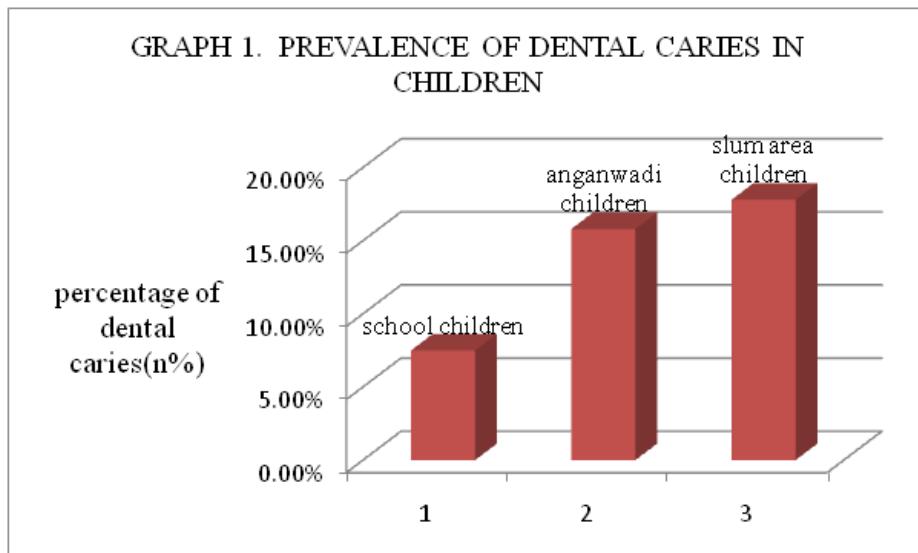
## RESULT

### 1. Prevalence of dental caries in children

Study revealed 11.6% prevalence of dental caries in children under age of five years. There was prevalence of 7.5% (18/240), 15.8% (20/127) and 17.8% (13/73) of dental caries in children in schools, anganwadi and slum area children respectively, as shown in table 1, & graph 1.

Table 1. Prevalence of dental caries in children in different strata

Characteristics	School children	Anganwadi children	Slum area children	Over all prevalence of dental caries
Dental caries (n)	18/240	20/127	13/73	(51/440) 11.6%
Dental caries (%)	7.5%	15.8%	17.8%	



## 2. Prevalence of dental caries in malnourished (wasting) children

Prevalence of dental caries was 34% (20/58) in malnourished children and only 8% (31/382) in healthy children, as shown in table 2. Inferential analysis also confirmed significant ( $p < 0.0001$ ), value (23) between dental caries and wasting in children, as in table 3.

**Table 2. Prevalence of dental caries in malnourished (wasting) children**

Characteristics	Wasting	Normal
Dental caries (n)	20/58	31/382
Dental caries (%)	34%	8%

Table 3. Chi square test of independence for prevalence of dental caries in malnourished (wasting) children

Characteristics	Dental caries	No dental caries	Chi square value ( $\chi^2$ )	P value
Wasting	20	38	34.06	(<0.0001) highly significant
Normal	31	351		

## 3. Prevalence of dental caries in malnourished (under-weight) children

Analysis showed prevalence of 19% (23/116) and 8.6% (28/324) dental caries in under-weight and healthy children, as in table 4. Further, significant ( $p<0.001$ ), value (  $\chi^2$  ) 10.429 was obtained between dental caries and under-weight in children, as in table 5.

Table 4. Prevalence of dental caries in malnourished ( under-weight ) children

Characteristics	Under-weight	Normal
Dental caries (n)	23/116	28/324
Dental caries (%)	19%	8.6%

Table 5. Chi square test of independence for prevalence of dental caries in malnourished (under-weight) children

Characteristics	Dental caries	No dental caries	Chi square value ( $\chi^2$ )	P value
Under-weight	23	93	10.429	(0.001) highly significant
Normal	28	296		

## 4. Prevalence of dental caries in malnourished (stunting) children

Further, prevalence of 12.7% and 11.1% of dental caries was found in stunted & healthy children as in table 6. This difference was not significant ( $p=0.64$ ), at ( $\chi^2$ ) 0.211 as in table 7.

Table 6. Prevalence of dental caries in malnourished (stunting) children

Characteristics	Stunting	Normal
Dental caries (n)	16/126	35/314
Dental caries (%)	12.7%	11.1%

Table 7. Chi square test of independence for prevalence of dental caries in malnourished (stunting) children

Characteristics	Dental caries	No dental caries	Chi square value ( $\chi^2$ )	P value
Stunting	16	110	0.211	(0.64) not significant
Normal	35	279		

## DISCUSSION

1. In present study, over all 11.6% prevalence of dental caries was found in children in city, fazilka in Punjab.

In another previous study, a prevalence of about 19% of dental caries was found in Udupi and Davangere, in southern states of india ( Tandon & Sethi, 1996), (Tyagi, 2008). Occurrence of dental caries is highly variable.

2. In present study, high prevalence, (34%) of dental caries was seen in malnourished children (wasting). This association was highly, ( $p<0.0001$ ), significant. Acute malnourishment (wasting) is a calories / protein deprived disorder of the growing children. Body becomes weak physically, mentally and psychologically. Immunity befalls. Hence, weak children are more prone to decay of primary teeth, ulcer around angle of mouth, fungal infection of oral cavity.

3. Under-weight is the long standing deprivation of essential calories and or protein rich. In the present study, dental caries prevalence was higher, 19% in children who were under-weight than those who were healthy, (8.6%). This association was again, highly significant,  $p<0.0001$ .

In previous study by (Oliveira et al., 2008), it was proved that dental caries caused malnutrition and inability to eat food.

Junk food, soft drinks and other ready made preparations are deficient of minerals and vitamins. These provide feeling of satiety without adequate calories. Furthermore, these dietary stuffs are dental caries prone. Hence, the children who are accustomed to these foods suffer both orally and generally.

3. In present study, prevalence of dental caries were slightly higher, 12.7% in stunted children in comparison to health children, 11.1%. But this association was not statistically significant, ( $p=0.64$ ). Similar findings were observed by Edalat et al., 2014.

## CONCLUSION

Dental caries and malnutrition are related in both ways. In advance stage, dental caries result into pain & swelling. These symptoms restrict child ability to eat. Chronicity of dental caries ultimately ends in malnourishment. Other side of this association is the weak immunity of malnourished children, that stem into oral and dental lesions.

Currently, changing dietary habits are also responsible for dental caries and malnourishment.

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