

The effect of dietary habits on dental caries prevalence among the primary school children in Iraq

Tarik Y. Khamrco

Layal A. Makani

Abstract:

The aim of study was to evaluate the effect of dietary habits (frequency of sweet consumption per day, pattern and type of sweet consumption) on dental caries prevalence on primary and permanent teeth.

The study was conducted on (286) primary school children, (132) boys and (154) girls 6-12 years old. Assessment of the dental caries were performed according to the basic method of the oral health survey of WHO. The recording of dental caries was performed using DMFT and deft indices.

The result showed that the mean DMFT for the total sample was (2.20) and for deft was (2.21). the boys reported less mean DMFT than girls with significant differences between them, while boys reported high mean deft than girls with no significant differences between them.

The result indicated that the pattern of eating sweets in between meals was found to be of predominant behaviors. Also the result demonstrated that the group eat sweet between the meals have highly significant mean DMFT and deft than the other groups.

The study revealed that the frequency of sugar consumption per day was 5.9 in girls and 4.7 in boys and the predominant form of frequency sweet eat was sweetened beverage followed by sticky foods. The mean DMFT and deft was highly significant in group eat (sticky foods, beverage sweetened and non-Sticky foods) than the group eat only (non-sticky foods and beverage sweetened).

From the findings of this study reducing sugar consumption, reducing the frequency of sweet consumption specially between the meals and avoiding sticky foods is an important part of caries prevention.

Key words: DMFT, deft, Dental caries, Dietary habits, School children

Introduction:

Dental caries is one of the common and widely spread oral disease, affecting children, adolescent, adults as well as elderly people especially in developing communities ⁽¹⁻⁵⁾. It is a major problem in dentistry should receive significant attention, from restorative and preventive stand point ⁽⁶⁾.

The prevalence and severity of dental caries in many developing countries is arising at an alarming rate, due to change in socioeconomic condition, dietary habits and lack of education ⁽⁷⁻⁹⁾.

Dental caries is multifactorial disease result from interaction of multiple factors include host resistance, diet and composition of the oral flora ^(10,11). Also the time must be considered in the etiology of dental caries.

Diet can effect the teeth in two ways, first while the tooth is forming before eruption and second, a local oral effect after the tooth erupted into the mouth. On the present evidences the post eruption local effect would seem to be very important dietary factor in the caries etiology. Sugar was found to be the most important dietary item and was the cariogenic food in relation to caries etiology. So dental caries is a sugar induced disease or sugar dependent infections disease ⁽¹²⁻¹⁴⁾.

It is generally accepted that the prevalence of caries is related to form in which sugar ingested (physical consistency), frequency of its consumption and time of ingestion of sugar foods and drinks ⁽¹⁵⁻¹⁹⁾.

Many studies carried out in Iraq reported the prevalence of dental caries in school children while no study reported the effect of dietary habits on dental caries etiology.

So, it was decided to conduct an study among primary school children to evaluate the effect of dietary habits (frequency of sweet consumption per day, pattern and type of sweet consumption) on dental caries etiology on primary and permanent teeth.

Materials and Methods:

Target population of the study was primary school children aged 6-12 years. A random sample of (286) children were examined, (132) boys and (154) girls.

Assessment of the dental caries was performed according to the basic method of the oral health surgery of WHO⁽²⁰⁾. The examination of children was carried out under natural day light in suitable room in school using plane mouth mirrors and WHO probe⁽²¹⁾. Recording of dental caries was performed using DMFT and deft indices. Radiography for detection of approximate caries was not recommended because of the impracticability of using the equipment.

In addition to the general information about age, sex the form include question about the pattern of sweet consumption (never, at meals time, between meals and both), also about the frequency of consumption of sweet per day and type of sweet consumption (sticky foods, non-sticky foods and sweetened beverage).

For the statistical analysis the mean of DMFT and deft were tested to their significant differences at 0.05 level using t-test.

Result:

Table (1) show the mean DMFT an deft by sex and for total sample. The mean DMFT and deft for the total sample were (2.20) and (2.21)

respectively. The boys reported less mean DMFT (1.96) than the girls (2.42), with statistically significant differences between them ($P < 0.05$) while the mean DMFT in boys was higher than girls with no significant difference between them.

The number of caries free children for the total sample was 27 children (9.4%).

Table (2) illustrates the number and percentage of children according to the pattern of sweet consumption. The result indicated the predominant habit of eating sweet was between the meals time, so half of children reported eat sweet between the meals only and third of the sample eat sweet at and between the meals time, while less than (2%) claimed never eat sweet. The percentage for the pattern of sweet consumption in boys and girls were of almost equal.

According to the frequency and type of sweet consumption, table (3) demonstrated that the girls more consumption sweet frequency (5.9) than the boys (4.7). The frequency of sweetened beverage consumption per day was more than sticky food, while non-sticky food reported the lower frequency.

The relation of pattern of sweet consumption and the mean DMFT and DMFT was shown in table (4). The result indicated that the children who consumption sweet between meals only have highly significant ($P < 0.01$) means DMFT and DMFT for both genders than the other pattern of sweet consumption. Also the children who consumption sweet at and between meals time is significant differs in mean DMFT and DMFT in both gender than the children who consumption sweet at meals time only or never eat sweet. According to the different between gender, the girls reported a significant differences than boys in the mean DMFT for the pattern of between meals only, while in DMFT the girls reported less than boys with no significant differences between them.

Table (5) shows the mean DMFT and DMFT in relation to type of sweet eat for both gender. The result demonstrated that there were three group according to the type of sweet eat, the first group was consist of (80) boys and (101) girls reported eat (sticky foods, non sticky foods and beverage sweetened), the second group consist of (32) boys and (30) girls reported eat (sticky foods and beverage sweetened), and the third group consist of (17) boys and (21) girls reported eat (non sticky and beverage sweetened). The mean DMFT was higher significant for the 1st and 2nd group than the third groups ($P < 0.01$). The girl reported significant high mean DMFT than boys in the three groups ($P < 0.05$). For the mean DMFT also the 1st and 2nd groups reported higher significant differences than the 3rd groups ($P < 0.01$). The boys reported slightly higher mean DMFT than girls with the 1st and 3rd group, while significant differences in the 2nd group.

Discussion:

This study is first study carried out in Iraq to evaluate the effect of dietary habits on dental caries prevalence in Iraqi school children.

The study show that the percentage of caries free children were (9.4%), that mean the prevalence of dental caries for total sample was (90.6%). The prevalence of dented caries in this study was nearly similar with other studies carried out in Iraq⁽²²⁻²⁴⁾.

Caries experience in present study was recorded using DMFT/deft indices. The DMFT index may allow the measurement of the past caries experience indicated by “missing” and “filled” components and caries at the present as recorded by “decay” component. The deft index used to overcome confusion of “missing” teeth due to caries or because of normal exfoliation.

The mean DMFT for total sample was (2.20) it was slightly higher than other studies carried out in Iraq^(22,25). Concerning sex comparison, the mean DMFT was higher significant in girls (2.42) than boys (1.96), these result were in accordance with other studies⁽²⁶⁻²⁸⁾, while disagreement with other studies, who found no statistically significant differences between boys and girls^(23,29,30). The sex differences is probably because of earlier tooth eruption pattern in girls than in boys of the same age group, thus exposed longer to the oral environmental factors and subjected earlier to caries attack^(24,27).

The mean deft for total sample was (2.21), comparison of this result other Iraqi studies will be difficult because most of them using deft index. The mean deft in girls (2.11) was less then boys (2.34) with no significant differences between them. This finding was in accordance with the other studies^(23, 25, 31). This may be due to shedding of primary teeth and early eruption of permanent teeth may explain the lower caries experiences in primary dentition in girls compare to boys. Also for primary dentition watt *et al*⁽³²⁾ found in their study on preschool children, that boys tended to consume larger quantities of sweeter drinks than girl, and Milen *et al*⁽³¹⁾ found that the boys lost more primary teeth due to decay than girls.

The study indicated that only (5) children (1.76%), (3) boys and (2) girls claimed never eat sweet. According to the pattern of sweet consumption, half of sample study reported frequency of sweet consumption between meals time and third of the sample reported sweet consumption at and between meals time. While only (16.43%) reported at meals time. That mean the pattern of eating sweets in between meals time was found to be of predominant behavior in this study, this fining is in agreement with other studies^(18,33).

There were no differences in percentage of pattern of sweet consumption between girls and boys, that mean no significant differences in dietary habit between both sex. This indicate there was no biological

different between boys and girls and supported the believe of that food habit is acquired from family and it is not inherited.

The mean DMFT and deft in relation to the pattern of sweet consumption, the result demonstrated that the group eat sweet between the meals only have highly significant mean than the other groups. Also the group eat sweet at and between meals time have significant high mean (about twice) than the group eat sweet at meals time only. This finding is in accordance with other studies^(15, 18, 33, 35). The findings of this study confirm the findings of Holbrook *et al*⁽¹⁹⁾, they reported that three or more between meal sugars snack per day, the caries markedly increased.

According to the frequency of sweet consumption per day and type (form) of sweet eat, the study show that the frequency of sweet consumption was (5.9) in girls and (4.71) in boys, this frequency was higher than other studies carried out in preschool children^(36, 37), While less than others^(18,38). The predominant form of frequency sweet eat was sweetened beverage, followed by sticky foods, this was disagreement with other Iraq study⁽¹⁸⁾ who reported more frequency of sweet sticky food consumption, this may be due to increase the availability to sweetened beverage now comparing with the previous study.

The findings of study in relation to caries prevalence with type of sweet eat indicated that the mean DMFT and deft was highly significant in groups eat (sticky foods, non-sticky and beverage sweetened) and (sticky and beverage sweetened) was higher than group eat (non-sticky foods and beverage sweetened). While there was slightly non significant difference between the 1st two groups. This indicated that the sticky food have an important effect in the prevalence of caries in permanent and primary teeth.

From the finding so this study reducing sugar consumption is an important part of caries prevalence, also it is advice to consume sugar rich foods at meal times rather than in between meals. This is because when consumed with other foods the effect on PH is minimized probably due to dilution effect and the increased salivary flow rate due to mastication of other foods. Although encourage the food product manufactures to produce low sugar or sugar free products including drinks, to enable individuals to make informed choice regarding sugar intake. The government should support research into prevention of dental caries through dietary means.

Table (1) mean DMFT and deft for both genders

Gender	No	DMFT		deft	
		Mean	± SD	Mean	± SD
Boys	132	1.96	0.34	2.34	0.73
Girls	154	2.42	0.39	2.11	0.62
Total	286	2.20	0.37	2.40	0.67

Table (2): Number and percentage of children according to pattern of sweet consumption

Pattern of sweet consumption	Boys		Girls		Total	
	No.	%	No.	%	No.	%
Never eat sweet	3	2.27	2	1.30	5	1.76
at meals	20	15.15	27	17.53	47	16.43
between meals	63	47.73	78	50.65	141	49.30
at and between sweet	46	34.85	47	30.52	93	32.51

Table (3): the mean frequency of sweet consumption per day according to type of sweets eat for both genders

	Boys	Girls
Sticky food	1.6	1.7
Non-sticky food	0.6	0.8
Sweet lead beverage	2.5	3.2
Total	4.7	5.9

Table (4): The mean (DMFT) and (deft) in relation to the pattern of sweet consumption for both gender

	DMFT		Deft	
	Boys	Girls	Boys	Girls
Never eat sweet	0.33	0.00	0.00	0.50
at meals	0.71	0.82	0.91	0.78
between meals	2.77	3.51	3.08	2.78
at and between meals	1.50	1.63	2.10	1.82

Table (5): The mean (DMFT) and (deft) in relation to type of sweet eat for both genders

	DMFT		deft	
	Boys	Girls	Boys	Girls
Sticky, non sticky, beverage sweetened	2.12	2.57	2.35	2.28
Sticky, beverage sweetened	2.02	2.65	2.80	2.12
Non-sticky, beverage sweetened	0.98	1.37	1.41	1.27

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