

Nutritional Status And Dental Caries In Five Years Old Kindergarten Children Of Baghdad City

Zayed S.Hassan *B.D.S.,M.Sc.

Summary:

Background: The mouth is often described to be the mirror of the body. Dental caries is an irreversible destructive disease affects dental hard tissue. Several studies showed relation between caries and malnutrition.

Objective: The aims of this study was to evaluated the malnutrition status influence on dental caries among 5 years old (index age).

Materials and Methods : Random sample of children was selected in Baghdad city. Oral examination was performed to report the prevalence and severity of dental caries according to the criteria of WHO. The assessment of malnutrition was performed using anthropometric measure (weight / age, height / age and weight / height).

Results : It was found that 51% ,8% and 77% of children were under weighted, stunted and wasted respectively. Differences between the prevalence of malnourished children (under weighted, stunted) and well nourished, with statistically significant differences. The differences in various stages of malnutrition indicators were recorded, with statistically highly significant differences. The prevalence of caries free children in stunted and wasted malnutrition indicators were difference than well-nutrition group, with statistically highly significant difference. Gender differences were present in malnourished indicators groups, with statistically highly significant difference. The mean values of dmft and dmfs in under weight and wasted mal-nourished were higher than well-nourished with statistically highly significant difference. Data reported that the mean values of males dmfs in mild malnutrition was higher than moderate, with statistically significant difference ($P < 0.05$).

Conclusion: The under weight and wasted malnourished children were more related to the prevalence and severity of dental caries than stunting one. Concerning three malnourished indicators, gender differences were recorded.

Keywords: Dental caries, malnutrition, children.

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Introduction:

Dental caries is multifactorial in etiology depend on the interaction of three main group factors that must exist simultaneously including host, microorganism and diet factors ⁽¹⁾. Several studies reported relation between malnutrition and dental caries (pre and post eruptive), when diet interaction on composition, morphology and eruption time of tooth and development and function of salivary glands ^(2,3,4,5,6). Some studies conducted in the world revealed that in chronic (stunting)and acute (wasting) malnutrition, tooth susceptibility to dental caries was increase as a results of systemic effect of protein energy malnutrition ^(7,8,9,10). In addition to that some found that protein deficiency retard development of bone and teeth which may cause crowding of teeth ^(11,12). The end results of specific nutrient deficiency during critical period of development is poor calcified teeth ^(12, 13, 14). For all of these reason, this study carried out to investigate the relation between malnutrition and dental caries.

Materials and Methods

The sample size of this study was composed of 632 children of 5years old. The children sample was selected randomly from different kindergarten, their age recording to the last birthday. Oral examination was carried out using plan mouth mirror (No. 4) and sickle sharp probe to record dental caries of primary teeth. Dental caries was diagnosis according to the criteria of WHO ⁽¹⁵⁾. This study conducted during 2004-2005. Anthropometric measurement was used, children were weight by bathroom scale (reading was ready to the nearest of 0.1 Kg as possible).The height of the children was measured using height measuring board place on the wall (measures recorded to the nearest of 0.1 cm). The indices of malnutrition were used (weight / age (acute malnourished or under weight), height / age (chronic malnourished or stunted) and weight / height (acute and chronic malnourished or wasted). Z- test and ANOVA test was used for data analysis.

Results :

Table 1 shows distribution of the sample, the mean values and standard error of weight (kg) and height (cm) by gender. The mean values of weight and height of males were found to be higher than that of females. Statistically there is no significant differences ($P > 0.05$).Results reveal that

* College of dentistry University of Baghdad

51% ,8% and 77% of children were under weighted, stunted and wasted respectively (Table 2). Data shows that the prevalence of malnourished children (under weighted, stunted) were significantly higher than that of well-nourished. While the picture was difference in concerning wasted malnourished group in compare to well-nourished. The prevalence of mild malnourished in under weighted and stunted were highest followed by moderate then severe with statistically highly significant differences. Concerning wasted group the prevalence of severe malnourished was the highest followed by moderate then mild types, with statistically highly significant differences (Table 3). Concerning caries free malnourished children, statistically gender differences were highly significant.

Table 4 illustrates the prevalence of caries free children according to three malnourished indicators by gender. Data reported that the prevalence of caries free well-nourished children were higher than that of under weighted children with no statistically significant differences ($P>0.05$). While the difference were recorded in stunted and wasted between two groups, statistically highly significant difference. Gender differences were present in malnourished indicators groups, with statistically highly significant difference. The prevalence of caries free males and females were difference in mild, moderate and severe of three malnourished groups, with statistically highly significant difference (Table 5).

Table 6 demonstrates in general that, the mean values of dmft and dmfs in under weight and wasted mal-nourished were significantly higher than that of well-nourished children. The mean value of dmft and dmfs in stunted malnourished were different than well-nourished children, with no statistically significant difference ($P>0.05$). Beside that, highly significant differences were found in the mean value of dmft and dmfs between well-nourished and malnourished males. Table 7 illustrates the relation of dmft and dmfs to the severity of malnourished according to underweighted, stunted and wasted. Differences between the mean values of dmft in wasted malnourished (mild, moderate and severe) were recorded in both gender, statistically significant difference.

Discussion:

Results recorded that the males heavier and taller than females and it is in agreement with Al-Obaidi study⁽¹⁶⁾. The mean weight and height in this study were slightly higher than other studies^(17, 18). Data recorded that malnourished (under weighted, stunted and wasted) males were more than females, This finding is in agreement with other studies^(17, 18), which was attributed to the fact that Y chromosome is weaker than X chromosome.

The present study revealed that caries free malnourished children (under weighted and stunted) were lower than that of well-nourished. This finding is in agreement with other world studies^(19,20). The prevalence and severity of dental caries were higher in malnourished (under weighted ,stunted and wasted) than in well-nourished children, this may be due to nutrition deficiency may increase tooth susceptibility to dental caries (changing in tooth formation^(10,21,22,23,24) or in saliva composition^(25,26) and function or jaw development⁽²⁷⁾) or combination of two or more and in accordance with previous cross sectioning studies .Results showed also that malnourished males had higher caries experience than females, this may be attributed to the fact that prevalence of malnutrition were more in males than in females^(17,18). Although caries experience dmft and dmfs in stunted malnourished group were lower than well-nourished group, but statistically there was no significant difference ($P>0.05$). Beside that prevalence of dental caries in under weight and wasted malnutrition was higher than stunted indicator, this finding is in agreement with some studies^(28,29). the effect of nutritional deficiency on eruption and teeth may be explain these results^(22,30)

Table (1): Distribution of Children, Weight and Height by Gender

Gender	No.	Percentage	Weight(Kg)		Height (cm)	
			Mean	SE	Mean	SE
Males	358	57%	17.85	0.19	118.72	0.43
Females	274	43%	17.59	0.23	118.3	0.51
Total	632	100%	17.74	0.15	118.53	0.33

Table (2): Distribution of Children According to (Weight /Age) ,(Height/Age) and (Weight / Height)

by Gender.

	Gender	Well-nourished		Malnourished		P value
		No.	Percentage	No.	Percentage	
Weight/ age	Males	163	46%	195	54%	P<0.05
	Females	149	54%	125	46%	P<0.05
	Total	312	49%	320	51%	P<0.05
Height/ age	Males	325	91%	33	9%	P<0.001
	Females	257	94%	17	6%	P<0.001
	Total	582	92%	50	8%	P<0.001
Weight/ Height	Males	77	22%	281	78%	P<0.001
	Females	71	26%	203	74%	P<0.001
	Total	148	23%	484	77%	P<0.001

Table (3): Distribution of Malnourished Children in Relation to Severity of Malnutrition According to (Weight /Age) ,(Height/Age) and (Weight / Height) by Gender

	Gender	Mild		Moderate		Severe		P value
		No.	Percentage	No.	Percentage	No.	Percentage	
		Weight/ age	Males	112	57%	64	33%	
	Females	77	62%	41	33%	7	6%	P<0.001
	Total	189	59%	105	33%	26	8%	P<0.001
Height/ age	Males	31	94%	2	6%	0	0%	P<0.001
	Females	13	76%	3	18%	1	6%	P<0.001
	Total	44	88%	5	10%	1	2%	P<0.001
Weight/ Height	Males	74	26%	102	36%	105	37%	P>0.05
	Females	53	26%	73	36%	77	38%	P<0.05
	Total	127	26%	175	36%	182	38%	P<0.001

Table (4): Prevalence of Caries Free According to (Weight /Age) (Height/Age) and (Weight / Height)

by Gender.

	Gender	Well nourished		Malnourished		P value
		No.	Percentage	No.	Percentage	
Weight/ age	Males	39	52%	36	48%	P>0.05
	Females	31	61%	20	39%	P<0.05
	Total	70	56%	56	44%	P>0.05
Height/ age	Males	66	88%	9	12%	P<0.001
	Females	47	92%	4	8%	P<0.001
	Total	113	90%	13	10%	P<0.001
Weight/ Height	Males	16	21%	59	79%	P<0.001
	Females	15	29%	36	71%	P<0.001
	Total	31	25%	95	75%	P<0.001

Table (5): Prevalence of Caries Free in Relation to Severity of Malnutrition According to (Weight /Age) (Height/age) and (weight / Height) by Gender.

	Gender	Mild		Moderate		Severe		P value
		No.	Percentage	No.	Percentage	No.	Percentage	
		Weight/ age	Males	21	58%	12	33%	
	Females	11	55%	9	45%	0	0%	P<0.001
	Total	32	57%	21	38%	3	5%	P<0.01
Height/ age	Males	9	100%	0	0%	0	0%	P<0.001
	Females	3	75%	1	25%	0	0%	P<0.01
	Total	12	92%	1	8%	0	0%	P<0.001
Weight/ Height	Males	10	17%	22	37%	27	46%	P<0.001
	Females	11	31%	14	39%	11	30%	P<0.01
	Total	21	22%	36	38%	38	40%	P<0.001

Table (6): Caries Experience (dmft, dmfs) According to (Weight /Age) (Height/ Age) and (Weight / Height).

		dmft							dmfs						
		Well norished			Malnorished				Well norished			Malnorished			
Gender		No.	Mean	± S.E.	No.	Mean	± S.E.	Z value	No.	Mean	± S.E.	No.	Mean	± S.E.	Z value
		Weight/ Age	Males	163	4.52	0.33	195	5.65	0.29	**2.76	163	9.31	0.88	195	10.9
Females	149		4.56	0.32	125	5.01	0.38	no	149	8.21	0.8	125	9.42	0.87	no
Total	312		4.54	0.23	320	5.4	0.23	**2.711	312	8.78	0.6	320	10.3	0.54	**2.763
Height/ Age	Males	325	5.2	0.23	33	4.55	0.74	no	325	10.3	0.58	33	9.09	1.82	no
	Females	257	4.81	0.25	17	4.06	0.93	no	257	8.91	0.62	17	6.47	1.58	no
	Total	582	5.03	0.17	50	4.38	0.58	no	582	9.67	0.42	50	8.2	1.32	no
Weight/ Height	Males	77	3.99	0.51	281	5.45	0.24	**3.24	77	8.64	1.49	281	10.6	0.57	**3.245
	Females	71	3.99	0.43	203	5.04	0.29	no	71	6.86	1.11	203	9.43	0.69	*2.21
	Total	148	3.99	0.34	484	5.28	0.18	**3.79	148	7.78	0.94	484	10.1	0.44	**4.119

*P<0.05 **P<0.001

Table (7): Caries Experience (dmft,dmfs) in Relation to Severity of Malnutrition According to(Weight /Age) ,(Height/Age) and (Weight / Height) by Gender.

		Dmft									dmfs								
		Mild			Moderate			Severe			Mild			Moderate			Severe		
Gender		No.	Mean	±S.E.	No.	Mean	±S.E.	No.	Mean	±S.E.	No.	Mean	±S.E.	No.	Mean	±S.E.	No.	Mean	±S.E.
		Weight/ Age	Males	112	6.04	0.36	64	5.03	0.56	19	5.47	1.06	112	11.7	0.85	64	9.66	1.33	19
Females	77		4.82	0.42	41	5.76	0.81	7	2.71	0.81	77	9.53	1.16	41	9.83	1.49	7	5.86	1.86
Total	189		5.54	0.27	105	5.31	0.46	26	4.73	0.83	189	10.8	0.69	105	9.72	0.99	26	9.19	1.74
Height/ Age	Males	31	4.65	0.77	2	3	3	0	0	0	31	9.48	1.91	2	3	3	0	0	0
	Females	13	4.15	1.13	3	5	1.53	1	0	0	13	6.77	1.98	3	7.33	1.76	1	0	0
	Total	44	4.5	0.63	5	4.2	1.36	1	0	0	44	8.68	1.47	5	5.6	1.72	1	0	0
Weight/ Height	Males	74	*5.57	0.49	102	5.56	0.41	105	5.27	0.36	74	11.3	1.22	102	11.3	1.05	105	9.45	0.73
	Females	53	**4.21	0.47	73	5.74	0.52	77	4.95	0.48	53	7.26	1.01	73	11.1	1.36	77	9.3	1.06
	Total	127	5	0.35	175	5.63	0.32	182	5.13	0.29	127	9.59	0.84	175	11.2	0.83	182	9.38	0.61

*F= 1.784 , P<0.05

**F= 1.77 , P<0.05

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