Association between Childs Nutritional Status and Some Socio-demographic Factors Related to Mothers In Diyala Governorate

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Abstract

Background: Proper nutrition is central in promoting the normal growth and development of children while malnutrition is one of the most important public health problems among preschool children and the nutritional status among these age groups might be affected with some demographical factors related to mother.

Objective: To identify the association between some socio-demographic factors related to mother and nutritional status of children less than two years of age in Diyala Governorate.

Materials and Methods: A probability sample (i.e. every element of the population has a known probability of being included in the sample), including (420) children less than two years had been selected from 12 Primary Health Care Centers in Diyala governorate, Iraq, during the period from 13th November 2010 to 10th March 2011, which were selected through a multi-stage (4 stages) random sampling technique, the study population was mothers and their children. Data were collected by direct interviewing of every child's mother via a using questionnaire. The questionnaire contained close ended questions. The nutritional status for each child determined by using the anthropometric measurements (weight and length) through z-score technique, Chi-square-test used for testing the contingency coefficient (causes correlation ship) and p-value above 0.05 considered as non-significant.

Results: The current study revealed that was no a significant association between child's nutritional status indicated by stunting and all the studied demographical factors related to mother at p-value (>0.05). Only in case of mother's educational level there was a significant association at p-value (<0.05). Regarding the association between child's nutritional status indicated by underweight, there was a significant association between child's underweight and all the studied demographical factors at p-value (<0.05) except in family type and age groups at p-value (>0.05). Also results of the study showed that there was no a significant association between nutritional status indicated by wasting and all the studied factors except in case of mother residency, there was a highly significant association at p-value (<0.01).

Conclusion: The current study concluded that the nutritional status indicated by underweight was significantly most affected by mother's related demographical factors.

Key words: Demographical factors, nutritional status, maternal age, marital status.

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Introduction

The nutrition of children less than two years of age is well known to start with breast-feeding because it improves child survival by providing protection against malnutrition and infectious diseases [1]. Thus, proper nutrition is central in promoting the normal growth and development of children while malnutrition is one of the most important public health problems among preschool children, in this age group the highest growth velocity occurs especially in the first two years of life. As a result the nutritional requirements are also the highest in this age group. So it is expected that more serious effects will be apparent as a result of nutritional deficiencies [2]. Mothers as they grow, the children of adolescent mothers tend to suffer poorer health than do the children of women who are age 20 or 21 when their first child is born. According to parents' reports of their children's health status, 60% of children born to non-teen mothers were rated in 'excellent' health, compared to 38% for children born to the youngest adolescent mothers [3]. Malnutrition is a result of more complex social and behavioral determinants that affect child feeding and rearing, socioeconomic and environmental conditions, together with feeding practices, are important determinants of malnutrition in developing countries [4].

Urban children generally have better nutritional status than their rural counterparts because the environment, choices, and opportunities of urbanites differ greatly from those of rural dwellers, from employment conditions to social and family networks to access to health care and other services [5]. Nutritional and social security of the family could be endangered by a negative change in marital status [6]. Additionally women's work outside the home has a negative effect on the anthropometrical status of infants, because of the quantity of food needed is small but frequent feeding, including breast feeding and maternal attention contribute to children's health and growth [7]. So this study designed to determine the rate of malnutrition among studied children as well as to find out any association between Child's Nutritional status and socio-demographic factors related to mother such as (residency, family type, maternal age, marital status, occupation and educational level).

Materials and Methods

This study was an analytical cross-sectional study and was conducted in Diyala governorate during the period from the 13th November 2010 to 10th March 2011. It was carried out in 12 primary health care centers which were selected through a multi-stage (4 stages) random sampling technique for 420 mothers whose children less than two years. The first stage included three sectors (Baqubah, Al- Muqdadyia and Al- Khalis) from six sectors in Diyala governorate by using simple random sampling; the second stage involved selecting two geographical areas (central and peripheral) from each sector and the third stage involved selecting four PHC centers from each selected sector and the fourth stage involved selecting a random sample of mothers with their children. The nutritional status for each child was determined by using the Anthropometric measurements; the measurements were taken during the study (Weight and Length).

Weight: The mother was asked to remove all the heavy clothes before weighing the child. The infant and younger children less than two years were weighed by using a balance beam table model (Seca type), after placing child in supine position and the scale was checked every time before measurements .

Length: Infants and younger children below two years who cannot stand, unassisted recumbent length (crown – heel length) had been employed. This was carried on a length board (Fiber-glass) which was done especially for this purpose. The child was laid on the board, which is itself on the flat surface when the head was positioned firmly on the fixed headboard; the knees were extended by firm pressure applied by the mother. Also the feet were flexed at right angles to the lower legs while the upright foot piece was moved to obtain firm with heels.

The Z-scores are a transformation of a normal distribution values in order to analyze its distance in relation to the mean and to express them in standard deviation units. It shows the direction and the standard deviations in which an individual value moves further from the mean [8]. The nutritional status indices were analyzed by :

Analysis of Weight for Length (WLZ): This was done according to WHO criteria. A child whose Weight for Height between (≥ -1 to ≤ +1 Z scores) are within normal, above the line 1 Z score shows possible risk of overweight, above the line 2 Z score is overweight, above the line 3 Z score is obese, below the line -2 Z score is wasted, below the line -3 Z score is severely wasted [9, 10].

Analysis of Weight for Age Z scores (WAZ): This was done according to WHO criteria, between (≥ -1 to ≤ +1 Z scores) are within normal, above the line 1 Z score shows possible risk of overweight, above the line 2 Z score is overweight, above the line 3 Z score is obese, below the line -2 Z score is underweight, below the line -3 Z score is severely underweight (Marasmus or Kwashiorkor) [12, 13].

Analysis of Length for Age Z score (LAZ): This was done according to WHO criteria. Stunting was diagnosed when the height for age Z score is below the line -2 Z score, below the line -3 Z score is severely stunted, between below -1 and above the line 2 Z scores are within normal. Above the line 3 Z score referred to the height of the parents, if they are tall the child considered normal. If they are short stature we have to investigation the child for hormonal assay [10, 11].

To accept or reject the statistical hypotheses, which included the followings: P-value: The 0.05 and 0.01 level of significance were used as a criterion to determine if there was a significant association or not. Chi-square (χ2–test) used for testing the contingency coefficient (causes correlation ship). All data analyzed by SPSS (VER.14)

Results

It's noted that most of the studied children (60.7%) were well nourished and they. While those children who were malnourished, the higher percentage of them (25%) had stunting (chronic malnutrition) while lower percentage (2.9%) had wasting (acute malnutrition), as shown in figure (1). From table (1), it's noted that the percentage of stunting, underweight, wasting were (27.2%), (16.7%) and (6.8%) respectively and were more in rural areas than urban areas, and the association between stunting and residency was not indicates a significant difference at (p=0.42) while there was a highly significant difference with both underweight (p=0.008) and wasting (p=0.001).

Regarding the family type, the percentage of stunting (27.3%) was higher in nuclear families, while underweight and wasting (13.7%), (3.4%) respectively were higher among children living within the extended families; these findings did not indicated a significant association between low nutritional status indicators and family type (p≥ 0.05).

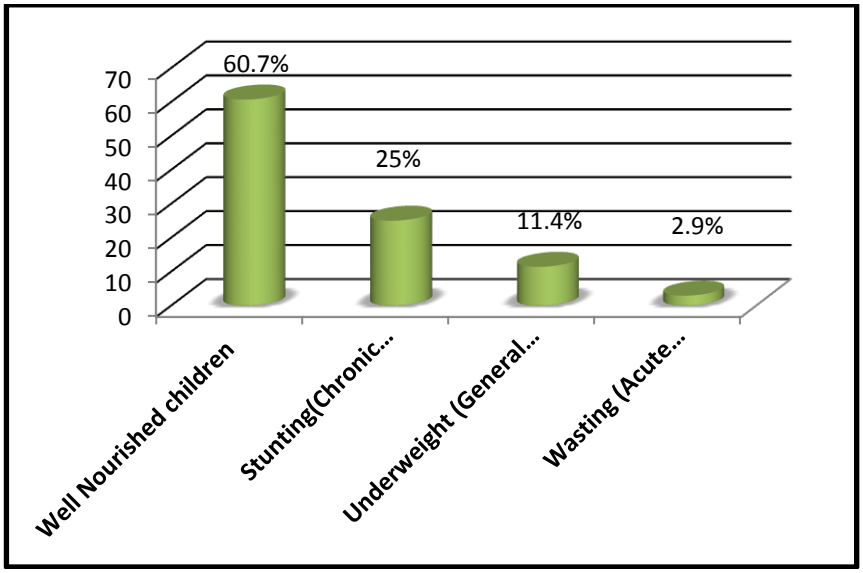

Figure (1): Distribution of studied children according to Nutritional Indicators

Table (1): Distribution of Nutritional status indicators in relation to residency and family type

Nutritional status indicator		**Stunting (HAZ<= -2)**		**Underweight (WAZ<= -2)**		**Wasting (WHZ<= -2)**	
Residency	**N = 420**	**N**	**%**	**N**	**%**	**N**	**%**
Rural	162	44	27.2	27	16.7	11	6.8
Urban	258	61	23.6	21	8.1	1	0.4
Chi-square (p-value)	-	**0.42[NS]**		**0.008****		**<0.001****	
Family type	**N = 420**	**N**	**%**	**N**	**%**	**N**	**%**
Extended	233	54	23.2	32	13.7	8	3.4
Nuclear	187	51	27.3	16	8.6	4	2.1
Chi-square (p-value)	-	**0.34[NS]**		**0.1[NS]**		**0.43[NS]**	

HS: Highly Significant at P<0.01**; NS:** Non-Significant at P>0.05

Table (2) shows the higher percentages of stunting, underweight and wasting were among children who had mothers aged (15-19) years and they accounted for (32.1%), (22.6%) and (7.5%) respectively, while the lower percentage of stunting (20.3%) was among children who had mothers aged (30-34) years; lower percentage of underweight (7.4%), and wasting (1.9%) were among children who had mothers ranging between (30-39) years. These findings did not indicate a significant association between the three kinds of malnutrition and mother's age.

Regarding the marital status, Table (2) shows that higher percentage of stunting (25.4%) and wasting (3%) among children who had both parents, with no significant association, while the underweight was more among children (35.7%) who had widowed or divorced mothers and there was a highly significant association (p=0.004).

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Table (2): Distribution of low Nutritional status indicators in relation to age groups and marital status

Nutritional status indicator		Stunting (HAZ<= -2)		Underweight (WAZ<= -2)		Wasting (WHZ<= -2)	
Age groups	**N=420**	**N**	**%**	**N**	**%**	**N**	**%**
15 - 19	53	17	32.1	12	22.6	4	7.5
20 - 24	110	28	25.5	13	11.8	2	1.8
25 - 29	113	25	22.1	9	8	2	1.8
30 - 34	69	14	20.3	8	11.6	2	2.9
35 - 39	54	16	29.6	4	7.4	1	1.9
40 - 44	21	5	23.8	2	9.5	1	4.8
Chi-square (p-value)	-	**0.64[NS]**		**0.11[NS]**		**0.35[NS]**	
Marital status	**N=420**	**N**	**%**	**N**	**%**	**N**	**%**
Widowed/Divorced	14	2	14.3	5	35.7	0	0
Married	406	103	25.4	43	10.6	12	3
Chi-square (p-value)	-	**0.35[NS]**		**0.004****		**0.51[NS]**	

***HS:** Highly Significant at P<0.01**; NS**: Non-Significant at P>0.05.

Table (3) shows that higher percentage of stunting (47.2%), underweight (31.7%) and wasting (10%) were among children who had employed mothers; the lower percentages of stunting, underweight (14.3%) and (7.1%) respectively were among children who had student mothers, the results did not indicated a significant association between the three kinds of malnutrition and mother's occupation. Table (3) shows that higher percentages (31.8%) of stunted children was among mothers who had ability to read, while the lower percentage (12.3%) of stunted children were among mothers who had completed either institute or college with a significant difference. Also the higher percentage (27.3%) of underweight were among children who had read and write mothers, while the lower percentage (1.2%) of underweight was among children who had mothers completed either institute or college with a significant difference. Regarding the relationship between wasting and educational level of the mothers, the higher percentage (12.5%) was among children who had illiterate mothers with no significant association (p=0.07).

Table (3): Distribution of nutritional status indicators in relation to mother's occupation and educational level.

Nutritional status indicator		Stunting (HAZ<= -2)		Underweight (WAZ<= -2)		Wasting (WHZ<= -2)	
Mother's occupation	**N=420**	**N**	**%**	**N**	**%**	**N**	**%**
Employed	68	13	47.2	4	31.7	1	10
Student	14	2	14.3	1	7.1	0	0
House wife	338	90	26.6	43	12.7	11	3.3
Chi-square (p-value)	-	**0.34[NS]**		**0.022***		**0.25[NS]**	
Educational level	**N=420**	**N**	**%**	**N**	**%**	**N**	**%**
Illiterate	16	3	18.8	3	18.8	2	12.5
Read and write	22	7	31.8	6	27.3	0	0
Primary school	180	57	31.7	21	11.7	6	3.3
Intermediate or secondary school	121	28	23.1	17	14	4	3.3
Institute or college	81	10	12.3	1	1.2	0	0
Chi-square (p-value)	-	**0.015***		**0.004****		**0.07[NS]**	

* **HS:** Highly Significant at P<0.01; **S:** Significant at P<0.05; **NS:** Non-Significant at P>0.05

Discussion

This study showed that the percentage of chronic malnutrition (stunting), general malnutrition (underweight) and acute malnutrition (wasting) accounted for 25%, 11.4% and 2.9% respectively, the rate of stunting in the present study was high, because of highest prevalence of food deprivation is observed in Diyala governorate, where approximately half the population was found to be food deprived according to a recent analytical study on Food Deprivation in Iraq done by Mehdi, et al with technical support from UNICEF, WFP and FAO, conducted in August 2010, [12]. A another study conducted by ministry of planning and development cooperation in Iraq as a comprehensive Iraq living conditions survey (2004), found that malnutrition among small children is widespread, 12% suffer from general malnutrition (underweight), 8% suffer from acute malnutrition (wasting), and 23% suffer from chronic malnutrition (stunting) and they found that the prevalence of acute malnutrition was highest in the south, while chronic malnutrition is most prevalent in the center region. While the northern region was better off with respect to all malnutrition measures [13].

This study showed that the percentage of stunting, underweight and wasting was more among children in rural areas, this was comparable with a comprehensive study conducted by Iraq Living Conditions Survey in 2004 which was conducted overall Iraqi governorates, it found that those stunted, underweight and wasted children were more in rural areas [13].

In the present study there was no a significant association between mother's residency and stunting; similarly Roger and Yongyout in DPRK found that there was no significant association between mother's residency and child stunting [14]. In the present study there was a highly significant association between residency and child underweight and wasting in the present study. Clara (2004) found that there was a highly significant association between mother's residency and underweight or wasting [15].

The current study showed that the higher percentage of stunting, underweight and wasting were among children who lived within families expending a sufficient to barely sufficient monthly income, without indicating a significant association between families income and any kind of malnutrition; this may be due to closeness in the socioeconomic status of studied children's families within the study sample. Comparably, Paramita *et al*,.(2010) in an urban slum of Ludhiana (2010), showed that family monthly income was not associated significantly with stunted and wasted children but there was a significant difference between income and underweight [16].

This study showed that higher percentage of underweight and wasting were among those who lived within extended families but only stunting was more among children who lived within nuclear families; there was no significant association between family type and any kind of malnutrition; similarly, Paramita in urban slum of Ludhiana (2010), found that there was no significant relationship between family type and child's stunting, underweight and wasting [16].

In the present study, child's Stunting, underweight and wasting were commonest where mother's age was <20 years as compared to these nutritional indicators where the age was more than 30 years. Some studies reported that younger childbearing was identified as a risk factor. It is suggested that adolescent mothers are not ready to take care of a child, whereas older mothers have more experience in child care and are likely to find solutions to their

problems [17]. These results coincided with study done by Mittal *et al* in Patiala (2004). They found that majority of stunting, underweight and wasting were among children who had mothers aged <20 years and minority of them had mothers aged more than 30 years [18]; in this study, there was no significant association between mother's age and child malnutrition. Clara in Malawi in a similar study found that there was no significant association between mother's age and child's stunting, underweight and wasting [15].

This study showed that higher percentage of stunted and wasted children had both parents, and the result did not indicate a significant association, but there was a highly significant association between divorced or widowed mothers and underweight; similarly Martin in Ghana (2010) found that Children who had divorced/separated mothers were strongly statistically significant (risk) for underweight compared to their counterparts [19].

In the present study, the higher percentages (47.2%), (31.7%) and (10%) of stunting, underweight and wasting respectively were among children who had employed mothers; the poor nutritional status could be due to absence of day nursery for those infants and young children or may be due to depending on uneducated grandmothers, or as result to frequent infections or those could be bottle fed infants; while the lower percentages of malnourished children were associated with student or housewives ; the student mothers may expending short time in the absence their children. With respect to housewives, they gave more time for child care and daily follow up. These findings did not indicating a significant association for both stunting and wasting with mother's occupation. But there was a significant association between mother's occupation and underweight. Similarly Gholamreza *et al.*, in Iran (2010) found that there was no association between stunting and wasting with mother's employment but only was significant with underweight [20]. In table (3), it was shown that mother's education seemed to play a protective role against child's malnutrition. Whereas the malnutrition decreased with increasing the mother's educational level. In the present study there was a significant association between educational level of the mother and stunting or underweight, but with no significant association with wasting. Wasting was high among children of illiterate mothers, these results were coincided with a study of Gholamreza *et al.*, in Iran (2010). They found that there was a significant association between child's stunting, underweight and low educational level but with no significant association with wasting [20].

In conclusions. This study concluded the stunting was most predominant among children less than two years as well as the nutritional status indicated by underweight was significantly most affected by mother's related socio- demographic factors including rural residency, marital status, occupation as well as educational level.

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