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Environmental factors of malnutrition diseases among children less than five years old in Babylon province

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Abstract

The present study reports the association between environmental factors and malnutrition diseases (underweight –low-weight for age). A sample of 1000 children aged less than five years old were randomly selected from urban and rural areas of Babylon province the middle - south of Iraq. In order to achieve objectives of the present study, the investigator used questionnaire which was conducted through extensive review of literature. The questionnaire was comprised of different items regarding to general information about their mothers and children, as well as the several environmental factors was studied in this study.

The result of this study revealed that were strongly associated between environmental factor and malnutrition diseases. Health education messages can be forwarded to mothers of children under five years old through mass media or a direct program.

Keywords; malnutrition diseases, environmental factors, children ,Babylon province.

Introduction

The total estimation number of starving people throughout the world are 960 million and 1/3 of them are children usually affected by the worse type of malnutrition Protein-Energy malnutrition (PEM)[1].Protein-energy malnutrition is still one of a major health problems that affects large number of children less than five years old in developing countries[2,3].Our nation is one of developing countries that accounted for this problem. An evidence is provided through a nutritional status survey which was carried out at the primary health care centers in Iraq. This survey revealed that 21% of Iraqi children under age five years old are malnourished and determined upon our scale of weight-for-Age criteria [4,5].

The Impact of environmental factor on protein-energy malnutrition in children has been well documented[6]. In study which was conducted as a part of a survey to estimate the prevalence of malnutrition in children aged 12-35 months in two neighboring districts (Altotaquali and Compas de Vacraria in Brazil), the study findings indicated that some environmental factors such as , type of building, family size, place of residence, and source of water consumed , can play an important role on prevalence of protein energy malnutrition among those children[7] .

An evidence was provided by [7,8,9]. They mention that infections contribute to childhood malnutrition not only through their adverse metabolic effects, but also reducing appetite by affecting absorption , and accelerating the intestinal status transit of food. In Bazer'swords, the usual effects are weaning diarrhea and repetitive acute respiratory disease , frequent weight loss, increased case fatality and growth retardation [10,11].Few studies have attempted to identify the association between these factors and nutritional status of children .

For example, higher prevalence of wasting and underweight has been reported among Kenyan children aged 3-38 months living in households with scanty, unprotected water supply comparing with children with adequate supplies of produced water[12].Additional support was provided in a study which was conducted to evaluate the status of failure to thrive among Lebanese children aged 8-48 months. In this study failing to thrive children were less likely than well-nourished controls to come from households with 3 or more rooms, with toilet facilities and piped water inside the home, as well as a bathroom and kitchen .

In a case-control study of many Bangladeshi mothers of malnourished children who were interviewed to the determination of association between their children nutritional status during infancy and severely malnourished, the study findings indicated that boys who had been hospitalized with marasmus or kwashiorkor during their 2 first year of life were marasmus likely to come from poorly built, more overcrowded houses with fewer furnishing and appliances than those of controls[13].However, the association of problems in all such studies reflected and considered that environmental factor may act as a confounding factors as well as indicator of wealth .

In the present study , which was conducted to described association between environmental factor and prevalence of malnutrition among children living in urban and rural areas of Babylon province , the investigator attempted to identify those indicators whose effects were still significant after family income had been taken into consideration.

Materials and Methods

The present study was achieved to assess the effects of environmental factor on the nutritional status of children less than five years old. The study was conducted in Babylon province ,which is one of the Iraqi governorates. It is situated in the middle of our nation . The study was carried out between 2 February,2014 to 2 September ,2014 among children of rural and urban areas.

Sampling

A probability sample of male and female children under age of five years old was randomly selected from the rural and urban areas of Babylon province. The sampling fractions for both gender were 49% girls and 51% boys, which was account in approximately 500 children for each gender .In total , 1000 children to be interviewed , (490 girls and 510) formed the study sample.

Study Instrument

A questionnaire was conducted by the researcher through extensive review of literature in order to achieve objectives of the present study. The questionnaire was comprised of 2 main Parts:-

1-Demographic Information

This part was comprised of different items as the following:-

1-1. General Information about the mothers and their children , such as mother age, family address, cell phone No., family numbers, child weight (Anthropometric Measurements) , child age, child sex, and child rank.

1-2. Enviromental factors:- It is included the following variables:

Availability of domestic water, source of water consumed, type of latrine, type of building material , type of family living status , and number of person pre room for sleeping.

Alpha correlation coefficient was computed for the determination of the internal consistency reliability which was ALPHA = 0.78 for the standard of the internal scale of the assessment and content validity of the study instrument was determined through the use of panel of experts. They were provided with copy of the study instrument and asked to review them for content clarity relevancy and adequacy. This responses had indicated that all of them had agreed all of the questionnaire items were clear, relevant and adequate. Minor changes were performed based on experts recommendation and suggestions.

Anthropometry

In order to achieve the objectives of the present study , the researcher used an anthropometric standards issued by World Health Organization (WHO) to classify the children's weight for Age. Each child was weighed with an Appropriate Health Resources Technologies Action(AHRTA)[14].

Data Analysis

Data analysis was applied through the usage of statistical Package of social sciences (SPSS) and the Microsoft excels (2010)[15].

Results and Discussion

The Demographic characteristic of the sample

Through out of the study findings, the sample demographic characteristic indicated that the ratio of male and female children approximately are equal ,(51%) and (49%) respectively. Children ages were concentrated between (12-23) months (31%), with (18%) aged between (36-47) months , (24%) aged between (24-35), and (27%) aged ($\geq$ 48) months. In respect to the birth order, it had been noticed that majority of sample (39%), (32.2%) among first and second birth order. Regarding the socio- economic level , the highly percent of children present among low and second levels of socio-economic status which accounts (38%),(34.4) respectively .

Generally speaking , these findings supported the fact that children of this type of demographic characteristics had a greater opportunity to experience malnutrition than others with respect to all the early stated characteristics. In regards to the environmental variables , the findings of the present study indicated that (59.6%) of sample had piped water available inside house comparing with 30.7% had not at all of domestic water 42 % of the children was provided by treated water,(19.2%) was consumed water from a

well , and (39.3%) was consumed water from spring or river. Households without flush toilet recorded (46.9%) and children had been used a pit as latrine accounted (40.1%).The majority of children had shared family living status who were almost equally distributed among rural and urban area and most of them had shacks and wood of building material. (Table 1) .

Table 1. Demographic Characteristics of the Sample

	General Information	**F.**	**%**
1	gender		
	Male	510	51%
	female	490	49%
	total	1000	100
2	age group / month		
	12--13	310	31.00
	24--35	240	24.00
	36--47	180	18.00
	>=48	270	27.00
	total	1000	100.00
3	birth order		
	1st - born	390	39.00
	2nd - born	322	32.20
	3ed - born	208	20.80
	fourth+- born	80	8.00
	total	1000	100.00
4	socio - economic status		
	Low	380	38.00
	median	344	34.40
	high	276	27.60
	total	1000	100.00

Environmental variables			
5	**Availability of domestic piped water**	**f**	**%**
	piped water available inside house	596	59.6
	communally water	97	9.7
	Not at all	307	30.7
	Total	1000	100
6	Source of water consumed		
	treated water	425	42.5
	from a well	192	19.2
	from spring or river	393	39.3
	Total	1000	100
7	Type of latrine		

	house hold without flush toilet	469	46.9
	pit latrine	401	40.1
	no latrine	130	13.00
	Total	1000	100
8	Type of building material		
	bricks or cement	310	31.00
	mixed wood and bricks	113	11.3
	shacks and wood	421	42.1
	other (metal sheet or mud)	156	15.6
	Total	1000	100
9	Type of family living status		
	Shared	690	69.00
	unshared	310	31.00
	Total	1000	100
10	Residential area		
	Rural	485	48.5
	Urban	515	51.5
	Total	1000	100
11	Number of person per room for sleeping		
	1--1.9	180	18.00
	2--2.9	440	44.00
	3--3.9	260	26.00
	>=4	120	12.00
	Total	1000	100

Distribution of the sample according to nutritional status

The sample was distributed according to the children nutritional status, which included normal nutritional status and abnormal nutritional status (underweight) to determine the nutritional status of children. Most important and common anthropometric indicators (weight for height, height for age, and weight for age) were used for assessing children nutritional status.

The researcher was selected weight for age indicator for assessing the children nutritional status , this is because the indicator was dependent from Iraqi Ministry of health as well as a suitable tool that is going with the progress of growth and development of Iraqi children less than five years old. Anthropometric data are most vulnerable when accurately measured and recorded over a period of time [16]. Children nutritional status considered as normal when value ranged from (- 1099 to -1sd) and (>-1sd) while abnormal was present in a form of underweight , ranged (<-2 sd to =2sd) . The proportion of underweight (9.5%) was considered high percentage according to the classification of nutritional status in term of severity [17]. (Table 2).

Table 2. Nutritional Status of the Sample Children (Prevalence)

Nutritional Status	**weight/age**	
	f	**%**
<=2 sd	95	9.5
-1.99 to – 1 sd	235	23.5
>-1sd	670	67.0
Total	1000	100

Table 2 showed that underweight (low weight- for- age) was recorded 9.5% according to the National Center of Health Statistics (NHCHS) values .

Association between Environmental Factors and Malnutrition Diseases

The data analysis manifestated that there were a significant association between malnutrition and availability of domestic piped water as well as the source of water consumed. Studies of the role played by water in causing diarrhea indicated that an increased availability of water seems to be associated with a reduced incidence of diarrheal disease, irrespective of changes in water quality [18,19].

The present findings supported by many studies that are done among children less than five years old in different countries. The association between incidence of malnutrition and source of water consumed was documented by [12]. The study was conducted to find out the association between water supply and nutritional status in rural northern Kenya. The results indicated an increase of underweight in children living in households with scanty, unprotected water supplies .Additional support was provided in a study which was conducted in order to identify the causes of failure to thrive among children in Lebanon, was found high level of association between an index of thriving and availability of piped water in the home[20] .This findings was definitely consistent with and support the findings of our present study (Table 3 and 4) .

Table3 . Association Between Children Health Status and Availability of Domestic Piped Water.

Availability of Domestic Piped Water	**Weight-for- age**		**normal**		**total**	**Chi square**	**P .value**
	f	%	f	%			
piped water availability inside house	11	11.6	710	78.5	821	9.04	0.02
communally water	20	21	166	18.3	186		
not at all	64	67.4	29	3.2	93		
Total	95	100	905	100	1000		

Table 3 shows that there was a significant association between children nutritional status and availability of domestic piped water

Table 4 . Association between Children Nutritional Status and the Source of Water Consumed

The source of water consumed	underweight		normal		total	chi-square	P. value
	F	%	F	%			
treated water	0.9	9.5	790	87.3	799	9.408	0.054
from a well	40	42.1	92	10.2	132		
from spring or river	46	48.4	23	2.5	69		
Total	95	100	905	100	1000		

Table 4 indicated that there was a significant association between children nutritional status and the source of water consumed.

Scientifically speaking, that the association of malnutrition and the environmental factor of water consumed , may be due either to some unidentified aspect of water quality or to confounding factors that have not be taken into account.

The strong association between the type of latrine as well as toilet facilities and malnutrition, remind significant , and children from households without a latrine were ten times more likely to have a low weight or malnutrition than those from households with a flush toilet (Table 5) .

In the above- mentioned Lebanese study, children who failed to thrive were also more likely than control children to come from a home without a toilet [20] .

Table 5 . Association Between Children Nutritional Status and the Type of Latrine

Type of Latrine	underweight		normal		total	Chi square	p. value
	f	%	f	%			
house hold without flush toilet	7	7.4	785	86.7	799	8.57	0.37
pit latrine	14	14.7	95	10.5	109		
Latrine	74	77.9	25	2.8	99		
Total	95	100	905	100	1000		

Table 5 revealed that there was a significant association between children nutritional status and the type of latrine.

The finding of this study revealed that there were a significant association between type of building material and number of person per room for sleeping with children nutritional status (Table 6,8) .Support of these finding was found in a study which was conducted in Bangladesh in order to find out the background histories of school children severely malnourished in infancy. The results of this study shows children living in houses built of bricks or cement were butter nourished than any other category, these children were three times less likely to be malnourished than those living in shacks and seven times less than those living in metal sheet or mud[13].

Similar association between malnutrition and characteristics of the unshared and crowding houses were also noticed in Bangladesh [13] and Lebanon [20] .In a longitudinal study which was conducted in the United Kingdom to find out the prevalence of illness in childhood ; the result of this study indicated that

children who slept alone were less likely to contract measles , mumps or chicken pox than those sharing bedroom[18].(Table 7).

Table 6 . Association Between Children Nutritional Status and the Type of Building Material

Typeof Building Material	**underweight**		**normal**		**total**	**Chi square**	**p. value**
	f	%	f	%			
bricks or cement	7	7.4	768	84.9	775	7.60	0.42
mixed wood and wood	16	16.8	102	11.3	118		
Shacks and wood	29	21.1	20	2.2	40		
other (metal sheet or mud)	52	54.7	15	1.6	67		
Total	95	100	905	100	1000		

Table 7 indicated that there was a significant Association between children nutritional status and the type of family living status.

Table7. Association between Children Nutritional Status and the Type of Family Living Status

family living status	**underweight**		**normal**		**total**	**Chi square**	**p. value**
	f	%	f	%			
Shared	75	78.9	92	10.2	167	3.49	0.406
Unshared	20	21.1	813	89.8	833		
Total	95	100	905	100	1000		

Table 8. Association between Children Nutritional Status and Number of Person per Room for Seeping

Person/ Room for sleeping	**underweight**		**normal**		**total**	**Chi square**	**p. value**
	F.	%	F.	%			
1-1.9	09	9.5	430	47.5	439	10.313	0.205
2-2.9	14	14.7	390	43.1	404		
3-3.9	30	31.6	60	6.6	90		
>= 4	42	44.2	25	2.8	67		
Total	95	100	905	100	1000		

Scientifically speaking, the sheared housing and crowding may affect the nutritional status throughout transmission of germs for person to the other by airborne way. Additional support was provided in a study which was conducted to investigate the social and environmental factors in child mortality .This study showed that the high risk of mortality rate increased among families living in poorly built houses with no availability of piped water[19].

In Summary, the environmental variables studied in the present study demonstrate a significant association between malnutrition and these variables not only in developing countries but also throughout developed countries.

Conclusions

1-Underweight (low weight For Age) considered a major health Problem among Preschool children in Babylon Province.

2-Proportion of underweight recorded the high percentages among preschool children in Babylon province.

3-Poor Environmental may Increase the risk of acquiring an infectious disease, which in turn may lead to malnutrition.

4-Several environmental factors were shown to be strongly associated with malnutrition.

Recommendations

1-Further and future studies should be undertaken among Preschool children on a large sample to identify the child nutritional status in our Nation.

2-Raising of standard of living and improvement of educational status among publics considered the corner stone for improving the children nutritional status. It is one of important mission of government's responsibilities.

3-Nutrition educational Program and Feeding Program should be strongly take place in nurseries and kindergartens.

4-Collaborative planning can be determined between the Ministry of Health and the Non-Governmental organizations to conduct health education and nutrition education campaigns through their centers across the Nation for women or care givers who had children under age of five especially those of families at risk of malnutrition.

5-Health education and nutrition education message can be forwarded to mothers of children under five years old through mass media a direct Program.

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