

Nutritional Status Assessment among School-Age Children

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Abstract:

Background: The state of one's nutrition is seen as a major and beneficial health indicator. It determines preschoolers' anthropometric measures, their height at the start of school, and the prevalence of low birth weight.

Methodology: A descriptive research design (cross sectional study), A Purposive sample of 100 child in the elementary school at Karbala city (one private & one government school). During period from during period from 15th October to 28thDecember .2022

Results: the result showed the length of the children ranged from 97 cm to 174cm with mean score (M= 131.64± 15.109)cm, the weight of the children ranged from 19 Kg to 79 Kg with mean score (M= 35.18± 12.963) Kg, and BMI ranged from 12.4 to 31.60 with mean score (M= 19.94± 4.652). also, It showed that the length of the children ranged from 97 cm to 174cm with mean score (M= 131.64± 15.109)cm, the weight of the children ranged from 19 Kg to 79 Kg with mean score (M= 35.18± 12.963) Kg, and BMI ranged from 12.4 to 31.60 with mean score (M= 19.94± 4.652).

Conclusion: Where children have a high level of body mass index, these reasons are due to the lack of activity of these children due to the prevalence of video games among them, as well as the adoption of fast food and other lack of physical activity

Recommendations: To encourage improvements in weight status, physicians should assess children aged 6 years and older for obesity and provide them or refer them to intensive counseling and behavioral therapies. Malnutrition can be avoid by following a healthy and balanced diet in children who are obese or undernourished.

Keywords: descriptive, Purposive, undernourished, Malnutrition

INTRODUCTION

Malnutrition, a disorder brought on by poor nutrition, affects children more than any other issue. It weakens the immune system and causes major growth and cognitive delays. Growth assessment serves as the primary indicator of children's health and nutritional status and a secondary indicator of overall population wellbeing. ⁽¹⁾

Suitable meals and diet are vital for appropriate physical development and growth to confirm ideal effort capability, normal generative act, suitable resistant responses and fighting to infections. Insufficient nourishment may produce severe forms of malnourishment in kids, vitamin A lack and iodine lack complaints. ⁽²⁾

Age-appropriate care can be planned with the knowledge of a child's developmental stage and consideration of it. Knowing that a child's sickness may have an impact on their growth and development enables the nurse to prepare for any developmental delays or regressions and tailor their care accordingly. ^(3,4)

The World Health Organization (WHO, 1995) has recommended a number of anthropometrically based indices to assess how well-nourished school-age children are. It is now well-established that the Body Mass Index (BMI) is the best indicator of teenagers' nutritional status (WHO, 1995; Himes and Bouchar, 1989; Must et al., 1991; Rolland-Cachera, 1993). ⁽³⁻⁵⁾

Nourishing situation is a significant key of the quality life for children. In this consideration, accepting the nourishing position of children has far-reaching inclusion for the well. ⁽⁶⁾

Nursing care for those children is vital through education the detection, prevention of malnourishment. Where the orders of normal measurements of growth and development of school-age children information and practices for children and their families to prevent malnourishment. ^(7,8)

The current study; is aimed to assess the general incidence of poor nourishment for school-age children, to evaluate age-sex styles in the level of poor nourishment for them, to mention procedures for improvement of the nutritious insufficiency of the school-age children and to offer a standard paper for future research.

AIM OF THE STUDY

This study aims to:

Assesse the nutritional status among school age children in Karbala city in Iraq.

Study question:

What is the state of school age children's nutrition in the Iraqi city of Karbala?

MATERIALS AND METHOD

Research Design:

A descriptive research design; used in the current research.

Setting:

The present study; carried out at the elementary school in Karbala (one privet & one government school).

Subjects:

After survey to the setting done by the researcher, 100 child who have the criteria done studied.

Inclusion criteria:

- 1) Age: 6 to < 12 years of both sex.
- 2) Agreed to participate in the current study.
- 3) Free from any chronic disease.

Tools:

The researcher to gather data in order to achieve the study's objective utilized the following tools:

Tool I: Biosocio-demographic structured interview:

This includes the following data as age, area of residence, sex, child's level of education, income status of parent's child.

Tool II: Assessment of nutritional status by anthropometry:

A human is measured using anthropometry. A quantitative method particularly when used to youngsters is very sensitive to nutritional status. In the current report, two fundamental variables—height and weight—as well as one derived variable—body mass index—will be used. The CDC table determined body mass index to calculate body mass index for selected heights and weights for age, ages 2 to 20 years, and it was computed using the following method. All anthropometric measurements will be taken using the standard techniques advised by (Lohman et al., 1988).⁽⁹⁾ Also, the CDC table calculated body mass index to compute body mass index using the following formula for specified heights and weights for ages 2 to 20:

$$\text{BMI (kg/m}^2\text{)} = \text{Weight (kg)} / \text{Height}^2 \text{ (m}^2\text{)}.$$

METHOD

The study design will accomplished as following:

1. Official approval carried out the study obtained from the responsible authorities at the previously mentioned research settings after explanation of the study purpose.
2. A pilot study carried out on (10) children to test the applicability of the tool, and the necessary modifications; done accordingly, data obtained excluded from the study.
3. The researcher through interviewing with the children collect data, and the measurements taken from them.
4. A structured interview conducted individually for each child 5-7 minutes with applying the tools.
5. After securing the administrative approval, data collection started. A sample of **100** child, who belong to the selected schools; and meet the criteria of subject's selection.

6. All children individually interviewed, and take their measurements for one time, by the researcher using the biosocio-demographic (Tool I) & assessment of nutritional status by anthropometry (Tool II).
7. Each Interview conducted approximately from 5-7 minutes or according to child's collaboration.
8. The necessary statistical analysis is carried out to assess the data received after the data collection is complete.

Ethical considerations:

- The study subjects; assured about the confidentiality.
- The study subjects; assured about the privacy of their data and of the anonymity of the record.
- Child's rights to be withdrawn at any time of research participate considered and respected.

Result

❖ **The following statistical tests were used:**

1. Frequency (N), mean (M), standard deviation (SD), percentage (%).
2. T test of two independent samples for differences in BMI according to the variables consisting of two groups.
3. One way ANOVA test for differences in BMI according to the variables that include more than two categories.
4. The differences that met the statistically significant criteria (p value 0.05) were deemed to exist.

Knowledge Levels category:

The levels of BMI were categorized according to CDC Tables into these levels as follows:

Weight Status Category	Percentile Range
Underweight	Less than the 5 th percentile
Healthy Weight	5 th percentile to less than the 85 th percentile
Overweight	85 th to less than the 95 th percentile
Obesity	95 th percentile or greater

Part 1:Demographic data

Table1 : distribution of the sample according to their demographic data

variables		*n = 100	
		N	%
1. Gender	Male	50	50.0
	Female	50	50.0
2. Age (Years)	7 y	20	20.0
	8 y	20	20.0
	9y	20	20.0
	10y	20	20.0
	11y	20	20.0
3. Income Status	high	50	50.0

	moderate	50	50.0
	low	0	0
4. class	First	20	20.0
	Second	20	20.0
	Third	20	20.0
	fourth	20	20.0
	fifth	20	20.0
5. place of residence	City	50	50.0
	the countryside	50	50.0

* n: number of sample

Table No. 1 shows the distribution of children participating in the study according to their demographic data, as it showed that 50% of them were female and 50% were male. They are distributed equally 20% in each age. Although distributed equally 50% between high-income status and moderate-income status. Equally distributed 20% in each class. Equally distributed 50% according to their place of residence between city and the countryside.

Part 2: BMI Assessment:

Table 2: means and standard deviation for children scales (long, weight, BMI).

	Min	Max	M	SD
1. long	97.00	174.00	131.64	15.109
2. weight	19.00	79.00	35.18	12.963
3. BMI	12.40	31.60	19.94	4.652

Table No. 2 shows means and standard deviation for children scales (long, weight, BMI). It showed that the length of the children ranged from 97 cm to 174cm with mean score ($M= 131.64 \pm 15.109$)cm, the weight of the children ranged from 19 Kg to 79 Kg with mean score ($M= 35.18 \pm 12.963$) Kg, and BMI ranged from 12.4 to 31.60 with mean score ($M= 19.94 \pm 4.652$).

Table 3: distribution of the sample according to their BMI levels at each age stage according to gender:

Age	Gender	BMI level							
		Under weight		healthy weight		over weight		obesity	
		N	%	N	%	N	%	N	%
7 y	M(n=10)	0	0	0	0	0	0	10	100
	F(n=10)	0	0	5	50	3	30	2	20
8 y	M(n=10)	0	0	7	70	0	0	3	30
	F(n=10)	0	0	6	60	2	20	2	20
9y	M(n=10)	1	10	6	60	2	20	1	10
	F(n=10)	0	0	7	70	1	10	2	20
10y	M(n=10)	0	0	6	60	3	30	1	10

	F(n=10)	0	0	4	40	2	20	4	40
11y	M(n=10)	0	0	2	20	2	20	6	60
	F(n=10)	2	20	3	30	1	10	4	40
Total	M(n=50)	1	2	21	42	7	14	21	42
	F(n=50)	2	4	25	50	9	18	14	28

Table No. 3: show the distribution of the children participating in the study according to their BMI levels at each age stage according to sex. Where we notice at the age of 7 years that all males 100 were obese, while the highest percentage of females 50% were of healthy weight, 30% over weight, and only 20% obese.

At the age of 8 years that the highest percentage of male and females 70%, 60% respectively were of healthy weight, while 30%, 20% respectively were obese.

At the age of 9 years that the highest percentage of male and females 60%, 70% respectively were of healthy weight, 20%, 10% respectively were overweight. While 10%, 20% respectively were obese.

At the age of 10 years that the highest percentage of male and females 60%, 40% respectively were of healthy weight, 30%, 20% respectively were overweight. While 10%, 40% respectively were obese.

At the age of 11 years that the highest percentage of male and females 60%, 40% respectively were of obese, 20%, 10% respectively were overweight. While 20%, 30% respectively were healthy weight, and 20% of females were under weight.

As total: 42% of males were of healthy weight, and the same percent 42% were obese, 14% overweight, and only 2% Underweight. On the female side e highest percentage of them 50% were of healthy weight, 28% obese, 18% over weight, and only 4% Underweight.

Table 4: Relationship between the child BMI and their demographic data

Variables		N	M	SD	T / f	P Value
Gender	Male	50	20.14	4.486	0.429	0.669
	Female	50	19.74	4.848		
Age (Years)	7 y	20	20.35	3.596	F 4.013	0.005**
	8 y	20	18.42	3.878		
	9y	20	18.04	4.452		
	10y	20	19.90	4.698		
	11y	20	23.01	5.155		
Income Status	High	50	19.39	4.104	T 1.192	0.000*
	moderate	50	20.50	5.123		

	Low	0	0	0		
Class	First	20	20.35	3.596	F 4.013	0.005**
	Second	20	18.42	3.878		
	Third	20	18.04	4.452		
	Fourth	20	19.90	4.698		
	Fifth	20	23.01	5.155		
place of residence	City	20	21.57	5.055	T 3.732	0.000**
	the countryside	20	18.31	3.567		

T: t test for The Independent sample, F: One Way Anova test, *: p value ≤ 0.05

Table No. 4 shows the statistical differences in the child BMI according to their demographic data. The ONE Way ANOVA test determined a statistical significance for differences in child BMI ($p= 0.005$) regarding age In favor of the upper mean I.e. in favor of "age 11 year" ($M= 23.01 \pm 5.155$). Also showed statistical significance for differences in child BMI ($p= 0.005$) regarding Class number In favor of the upper mean I.e. in favor of "fifth class" ($M= 23.01 \pm 5.155$).

The **t. test** determined a statistical significance for differences in child BMI ($p= 0.000$) regarding Income Status In favor of the upper mean I.e. in favor of "moderate Status" ($M= 20.5 \pm 5.123$). Also showed statistical significance for differences in child BMI ($p= 0.000$) regarding place of residence In favor of the upper mean I.e. in favor of "city" ($M= 21.57 \pm 5.055$).

However, previous tests did not show any statistical significance for differences in child BMI ($p \geq 0.05$) according to the child gender.

Discussion

World Health Organization (WHO, 1995) has suggested various indices based on anthropometry to evaluate the nourishing position of school-aged children, and we found in the result of our research the BMI is one of the other indices that we can consider to evaluate the nutrition status for children.⁽¹⁰⁾

The size of the kids is determined by anthropometry. It is a quantitative approach that is extremely sensitive to nutritional status, particularly amongst children. In the current report, two fundamental variables—height and weight—as well as one derived variable—body mass index—were used. All anthropometric measurements were made using the recommended procedures (Lohman et al., 1988)⁽²⁾, and the CDC table firm BMI was estimated using the following formula for the designated heights and weights for children aged 6 to 12 years: $\text{Weight (kg)} / \text{Height}^2 \text{ equals BMI (kg/m}^2\text{) (m}^2\text{)}$.

The result of our research shows that the relatively high occurrence of undernutrition detected between schoolchildren who belong to parents who had moderate-income status, the causes may be due to the insufficient nutritional consumption of diet. The result corresponds with Srivastava, et tal, where they found the most children who have a subnormal BMI whose belong to the slums places where the parents are of a low-income status.^(9,12)

Amuta et al, accordance to the various locations of the schools, it was discovered the undernutrition was common among schoolchildren in Makurdi's slum areas.⁽¹³⁾ And this result corresponds with our result, which showed statistical significance for differences in child BMI ($p= 0.000$) regarding the place of residence of children who live in the city. where the children have high level BMI, These reasons are due to the lack of activity of these children due to the spread of video games among them, as well as the adoption of fast food and other lack of physical activity.

According to the table4, a child's age and class have a significant relationship with BMI, as we found in the research the High level of BMI when age increases, and this may be relate to fast food and consumption of more sweets than homemade food, which is healthier, this result corresponding with Finn KE, et al, 2018.⁽¹⁴⁾

Recommendations:

1. The initial suggestion is for quick therapy, which can be given in a doctor's office. Subsequent stages demand more time and resources.
2. To encourage improvements in weight status, physicians should assess children aged 6 years and older for obesity and provide them or refer them to intensive counseling and behavioral therapies.
3. Malnutrition can be avoid by following a healthy and balanced diet in children who are obese or undernourished.
4. Children who are underweight; should have more vitamins and minerals that the body needs.

Conclusion:

The nutritional status is one of the basic things that affect the development and growth of children, especially at school age. Body mass index is an important indicator of the nutritional status of the child, so we relied on it in this research.

The result of our research shows that the relatively high incidence of undernourishment among schoolchildren belonging to middle-income parents, the reasons may result from a diet that isn't adequate.

We found that there is a statistical significance for the differences in the body mass index of children ($P. = 0.000$) regarding the residence of children who live in the city. Where children have a high level of body mass index, these reasons are due to the lack of activity of these children due to the prevalence of video games among them, as well as the adoption of fast food and other lack of physical activity.

As, it turns out that the age and category of the child have a great relationship with the body mass index. Where we found in the research the high level of the body mass index when the age increases, and this may be related to fast food and the consumption of sweets more than home-made foods and thus the increase in the percentage of fats and sugars in the food and as a result the increase in obesity .

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