

Assessment the Nutritional Status by Anthropometric measurements for the students of secondary schools in Al- Hilla city

Ali Husain Hasab, MSN*
KahtanHadi Husain, Ph.D. **

* Master Student, Community Health Nursing, College of Nursing, University of Babylon. Alialhusain451@gmail.com Telephone: 07803462591 (Corresponding author)

** Prof., Community Health Nursing, College of Nursing, University of Babylon.

Abstract:

Background: Nutritional status is indicator of person and community level well-being and safety where it is necessary to identify risk status while planning health promotion activities, nutritional diagnosis and disease prevention. In several ways linked to nutritional status, anthropometrics is used as markers of fitness, growth and development in childhood and adolescence.

Objectives: this study conducted To assess the status of the nutrition for students in secondary schools using measurements of Anthropometric indices also To identify the relationship between anthropometric parameters and some affected variables including students Age ,Gender ,Family socio-economic level ,status of parents education, professional status of parents, size of house hold and rank of sibling.

Methodology: Descriptive study conducted on the students of secondary schools of

Al-Hilla city aged 12 to19 years for the period from 10th of February to the 15th of August of 2019. The selection of sample was conducted in two stages the first stage was choose 18 schools of secondary schools that found in Al-Hilla city then the second stage was selection the students were selected 421students from the schools of Hillacity .

Results: the study results obtained that 73.3% of the boy students were have normal weight, 14.9% were overweight, 10.9% were obese and 1% of boys were under –weight, while in girls the percepts was:

69.4%, 14.6%, 12.3% and 10.9% normal weight , overweight, obesity and underweight respectively. also this study estimated that there is significance relationship between triceps skin fold thickness and the gender.

Conclusions and recommendations: According to the body mass index the percent of girls who have overweight was 14.6% and obesity was 12.3% while in male the obesity percent was 10.9 % and overweight was 14.9%. so must Educate the students to emphasis on the quality of the eaten food not on quantity.

Key words: nutritional status, Anthropometric measurements, students

1. INTRODUCTION:

The nutrition consider one of the most important factors that have great effect on the human life quality because that have directly effect on the growth where the nutrition disorders effect on the failure of growth and development and lower resistance of infection and disease also malnutrition at long term have impact on the height and weight so may be generation suffer of congenital malformation) Sapienza .,et., 2017(

Nutritional status is very important in assessing a factor response from the body that can cause illness if not resisted. No medication would be entirely successful if the child's nutritional status is deficient or unbalanced and the nutritional

status is influenced by various factors of socioeconomic status, age sex, parent educational level and sibling rank of people) Zackaria, S., et al., 2019

The nutritional status can be determine through measurement of the anthropometry which mean Study of human body measurement in terms of the bone , muscle and adipose (fat) tissue dimensions. Measures of subcutaneous adipose tissue these measurements are significant as it is confirmed that individuals with large values are at elevated risk from certain diseases, ex. Hypertension, adult mellitus diabetes , cardiovascular disease, gallstones, arthritis and other illnesses.

These anthropometric measurements, together with the dietary and related questionnaire data and biochemical determinations, provide important and relevant details that may be required to better explain the data obtained from the sample ,Warnakulasuriya., et al., 2019).

Anthropometry with diet are related and affected by some factors comprise genes with environmental factors, socio-cultural status, lifestyle, functional condition, and health (Castillo-Martínez., et al.,2012).

2. METHADODOLOGY:

Study design: This study is used to evaluate the nutritional status of the students of secondary schools in Al-Hilla city the study is descriptive . This study started at 10th of February to 15th of August 2019

Study sample: A multistage sample of(421) students is selected through probability sampling

Study instrument: The data was collected by used a developed questionnaire (Arabic versions) through interview with students to answer about some socio-demographic data and then the investigator measure the Anthropometric measurements by the instrument that put to this purpose that include the tap measurements to measure the height and mid upper arm circumference ,weight scale and caliper to measure skin fold thickness.

Statistical analysis: The present study data was analyzed through use SPSS (statistical package of social science version 24.the following approach of statistical data analysis were used in the study:

- 1. Analysis of descriptive data:
- 2- Statistical Analysis of inferential data:
 - a. Chi- square b, Binominal c, Mann- Whitney test **Results:**

Table (1): Demographic Data of the study sample:

Demographic data	Rating - intervals	Frequency	Percent	C.S.* P-value
Age / years	12-13	62	14.7	$\chi^2 = 27.580$ d.f. = 3 p= 0.000 HS
	14 - 15	132	31.4	
	16 - 17	123	29.2	
	18-19	104	24.7	
	Total	421	100.0	
	Mean (std. Dev.)= 15.84 (2.0)			
Gender	Male	202	48.0	Binomial P= 0.205 NS
	Female	219	52.0	
	Total	421	100.0	

Residency	Urban	240	53.2	Binomial P= 0.205 NS
	Rural	181	46.8	
	Total	421	100.0	
Phase of the study	Intermediate school	201	47.7	Binomial P= 0.000 HS
	Preparatory school	220	52.3	
	Total	421	100.0	
Marital status	Married	18	4.3	Binomial

	Single	403	95.7	P= 0.000
	Total	421	100.0	HS
Father's occupation	Governmental employee	174	41.3	χ^2 =176.812 d.f.= 4 p= 0.000 HS
	Daily fee worker	53	12.6	
	Free worker	104	24.7	
	Retired	30	7.1	
	Jobless	21	5.0	
	Owner worker	14	3.3	
	Other	25	5.9	
	Total	421	100.0	
Mother's occupation	Governmental employee	81	19.2	χ^2 767.349= d.f. = 4 p= 0.000 HS
	Housewife	305	72.4	
	Owner worker	10	2.4	
	Free worker	18	4.3	
	Other	7	1.7	
	Total	421	100.0	
Father's levels education	Doesn't read and write	16	3.8	χ^2 =176.812 d.f. = 4 p= 0.000 HS
	Read and write	12	2.9	
	Primary	44	10.5	
	Intermediate	56	13.3	
	Secondary	126	29.9	
	Bachelor or institute	151	35.9	
	Higher studies	16	3.8	
	Total	421	100.0	
Mother's levels education	Doesn't read and write	16	3.8	χ^2

	Read and write	40	9.5	=167.216 d.f. = 6 p= 0.000 HS
	Primary	74	17.6	
	Intermediate	106	25.2	
	Secondary	97	23.0	
	Bachelor or institute	86	20.4	
	Higher studies	2	.5	
	Total	421	100.0	
Family type	Nuclear	339	80.5	Binomial P= 0.000 HS
	Extended	82	19.5	
	Total	421	100.0	
Rank of sibling	1-3	246	58.4	χ^2 =167.812 d.f. = 2
	4 – 6	151	35.9	
	7 – 9	24	5.7	
	Total	421	100.0	p= 0.000 HS
Number of family members	1-3	6	1.4	χ^2 =265.261 d.f. = 3 p= 0.000 HS
	4 – 6	162	38.5	
	7 – 9	210	49.9	
	10+	43	10.2	
	Total	421	100.0	
	Mean (std. Dev.) = 7 (1.9)			
Level of socio-Economic status	High	37	8.8	χ^2 =385544 d.f. = 2 p= 0.000 HS
	Middle	330	78.4	
	Low	54	12.8	
	Total	421	100.0	

*HS: Highly Significant; NS- Non-Significant at P value more than 0.05, C.S- Comparative Significant. P-value-probability Value.

Table (1) demonstrated that (31.4%) of the study sample are 14-15 years old, (52%) are female, (53.2%) are urban residents, (52.3%) are secondary school students, and (95.7%) are not married.

In addition, (41.3%) of fathers are governmental employed, while (72.4%) of mothers are housewives. Regarding parents' levels of education, the study results indicate that (35.9%) of fathers have a bachelor and/or diploma degree, while (25.2%) of mothers are intermediate school graduated. Furthermore, (80.5%) of families are nuclear family, (58.4%) of students are first to third child in the family, (49.9%) of families have 7-9 member, and (78.4%) of families have a middle economic status.

Table (2): Observed Frequency distribution, Percent and Cumulative Percent of BMI Association to Gender in Comparison with Significance

BMI / Gender			Frequency	Percentage	C.S.* P-value
Male	BMI	undernutrition	2	1.0%	Z = - 0.123 P= 0.902
		Normal	148	73.3%	
		Overweight	30	14.9%	NS
		Obese	22	10.9%	
		Total	202	100.0%	
Female	BMI	under nutrition	8	10.9%	NS
		Normal	152	69.4%	
		Overweight	32	14.6%	
		Obese	27	12.3%	
	Total	219	100.0%		

This table demonstrated that the more percent of the boy students in the study sample is within normal value and their accounts was (73.3%). And the girls students results indicate that the majority percent of them are also with the normal range and their percent accounts (69.4%). This table shows that there is no-significant relationship between the body mass index and the gender at P-value > (0.05).

Table (3): Distribution of the Observed Frequency, Percent and Cumulative Percent of MUAC and explain Relative to the Gender of the students in Comparison with Significance

MUAC / Gender			Frequency	Percentage	C.S.* P-value
Male	MUAC	5	42	20.8	Z= -1.805 P= 0.071 NS
		10	34	16.8%	
		25	34	16.8%	
		50	46	22.8%	
		75	30	14.9%	
		90	12	5.9%	
		95	4	2.0%	
Total		202	100.0%		
Mean (std.dev.) 35.79 (29.428)					
Female	MUAC	5	15	6.8%	NS
		10	27	12.3%	
		25	96	43.8%	

		50	38	17.4%
		75	24	11.0%
		90	9	4.1%
		95	10	4.6%
	Total		219	100.0%
Mean (std.dev.) 37.47 (26.128)				

This table shows that boy students, in the study sample the 50th Percentile are largest where accounted for (22.8%) and students girls in the study sample are also the biggest in 25th Percentile accounted for (43.8%), and there is a non-significant relationship between the mid-upper arm circumference and the gender at P-value more than 0.05.

Table (4): Distribution of the Observed Frequency, Percent and Cumulative Percent of Triceps Skin Fold Thickness Relative to Gender in Comparison with Significance

TSFT / Gender			Frequency	Percentage	C.S.* P-value
Male	TSFT percentile	5	8	4.0%	Z = -3.018 P = 0.000 NS
		10	18	8.9%	
		15	0	0.0%	
		25	44	21.8%	
		50	68	33.7%	
		75	32	15.8%	
		90	16	15.8%	
		95	16	7.9%	
	Total	202	100.0%		
Mean (std.dev.) 49.99 (27.258)					
Female	TSFT percentile	5	10	4.6%	
		10	20	9.1%	
		15	2	.9%	
		25	40	18.3%	
		50	54	24.7%	
		75	52	23.7%	
		90	29	13.2%	
		95	12	5.5%	
	Total	219	100.0%		
Mean (std.dev.) 53.11 (28.798)					

This table shows that males, in the study sample the 50th Percentile are largest accounted for (32.7%) and females in the study sample are also the biggest in 50th Percentile accounted for (24.7%), and there is a highly-significant relationship between the Triceps Skin Fold Thickness and the gender at P-value 0.000

3. Discussion of the results:

The age group at (14-15) was the most age group the shared in the study

Also in same table the percent of other age group was (12-13) accounted 14.7% and others in following (14-15),(16-17), (18-19) were accounted 31.4%,29.2%and 24.7%. The difference of percent in each age group is because difference of age in each study phase this percent of age group is highly significant at p(0.000). the girls percent was 52% ,219 girls and boys percent 48%, 202 boys the girls percent was greater percent in the study. demographic the level of education of fathers of the great sample was Bachler degree where there percent was 35.9% of the sample.

the great percent was Nuclear family where there percent was 80.5%and extended family formed 19.5% where there is highly significant at p(0.000).

In part of rank of sibling the great students there orders in family among 1-3 where percent of them was 58.4% and others percent was (4-6),(7-9) percent of them was as following 35.9% and 5.7% this results it Highly significant at p(0.000).

Finally the level of socioeconomic status was middle level at more sample of the study there percent was (78.4%), (8.8%) for high level and (12.8%) for low level this results highly significant at p(0.000).

In Table(2) the results show that the majority of male sample of the study was in normal weight where there percent was 73.3% this percent is not significant at p(0.902), underweight percent was 1.0% and overweight percent was 14.9%, and obesity percent was 10.9%. While in female the sample results was as following : under-nutrition percent of subjects of the study was 10.9%, normal weight percent was the majority percent where was 69.4%, overweight percent was 14.6% and obesity percent in females was 12.3%. and percent of overweight of female was 10.9%.and The table .also demonstrated that there is no significant relationship between mass index of body and student's gender at P- > (0.05). This finding agree with a study conducted in Saudi Arabia to assess the nutritional status of adolescent girls where the result showed that more the study sample was normal weight and 21.73% of the study sample was overweight and obesity(Waseem, F., et al 2019).

The results of this study also agree with a study conducted in Kirkuk city of Iraq among 537 adolescents where the percent of adolescence who have obesity 22.3% . of the study sample(Ma'ala., et al 2013).

In table(3) show that the largest percentile of male MUAC was 50th percentile where there percent was (22.8%) then the 5th percentile (20.8%) ,the 10th and 25th was the same percentile(16.8%) and after them

Was the 75th percentile(11.0%),then 95th percentile was (4.6%) and finally 90th percentile where it percent was (4.1%).

While in females the largest percent was 25th percentile, there percent was (43.8%) then 50th percentile at percent 17.4%of body sample, then 10th ,75th ,5th 95th, 90th as following at percent(12.3%, 11.0%, 6.8%, 4.6% and 4.1%). According to this results there is a nonsignificant relationships between the MUAC and the students gender at P- more than 0.05.

There is study conducted of Al- Najaf Al-Ashraf Governorate of Iraq to assess nutritional status of adolescence by anthropometric measurements this study estimated that the MUAC of female was majority in the 25th percentile where accounted a 75.9% of study sample that consist of 1330. But in male this study disagree with our study where the largest percentile was 25th percentile.(AL-Zurfy, et al 2012)

Table (4) show that in females, the study sample of the 50th Percentile are largest where accounted for (32.7%) of body sample then 75th accounted 23.7% then 25th accounted 18.3%, then 90th ,10th ,95th and 5th as following. While males of the study sample are also the biggest in 50th Percentile accounted for (24.7%),then 25th accounted 21.8%, then 75th and 90th were the same percent that accounted 15.8%, then 95th, 10th and 5th as following .according to this table there a highly significant relationship among the TSFT and the students gender at P-value0.000.

Triceps skin fold thickness were significantly higher in females than in males.(RamírezVélez, R., et al., 2016)

This results agree with a study conducted in the Najjaf governorate of Iraq estimated that the biggest percent of measure TSFT was in 50th percentile(AL-Zurfy., et al., 2012)

Another study in Saudi estimated that the increase in body mass index may be related with increase rate of triceps skin fold thickness(Omar., et al., 2017).

The study estimated that there is a significant association among status of nutritional status and some socio-demographic variables of age, stage, social status, father's occupation, mother's occupation, fathers and mothers' levels of education, family type, and number of family members at p-value less than 0.05. Where there is no significant relationship with gender, place of residence, Rank of s bling, and level of socioeconomic at p more than 0.05.

A study conducted by Kankana on adolescent girls estimated that there is no relationship between the level of socioeconomic status and nutritional status (Kankana., 2016).

4. Recommendation:

Educate the students to emphasis on the quality of the eaten food not on quantity. Also To improve the nutritional status of students must on the government to raise the living level of the families in relation of socioeconomic to improve the nutritional status. And Formation a joint team from members of ministry of health, ministry of education, and ministry of high education and scientific research to confirm field survey to determine the nutritional status and conduct the necessary to improve nutritional status of students.

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