

Assessment of Nutritional Status of Pregnant Adolescents in Baghdad City

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المستخلص

الهدف: تقييم الحالة التغذوية والتعرف على المشاكل الصحية ذات العلاقة بالتغذية وإيجاد العلاقة بين الحالة التغذوية والصفات الديموغرافية للياقعات الحوامل في مدينة بغداد.

المنهجية: دراسة وصفية أجريت للفترة من العشرين من نيسان إلى الثلاثين من شهر حزيران عام ٢٠٠٩ من خلال أخذ عينة عمدية مكونة من (١٩٦) يافعة حامل تتراوح أعمارهن بين (١٣-١٩) سنة ممن يراجعن (١٤) مركزا للرعاية الصحية الأولية في مدينة بغداد للحصول على الرعاية الصحية خلال فترة الحمل. جمعت معلومات الدراسة بواسطة الباحث الذي قام بمقابلة الياقعات الحوامل وملئ الاستمارة الاستبائية المعدة لغرض الدراسة. تم تحقيق ثبات الاستمارة من خلال حساب معامل الارتباط (الفكرونباخ) لمفردات نوعية الحياة للياقعات الحوامل وتطبيق (الاختبار وإعادة الاختبار) من خلال حساب معامل الارتباط (بيرسن) لنفس المفردات. تم تحقيق صدق محتوى الاستمارة من خلال مجموعة من الخبراء. تم تحليل البيانات من خلال أسلوب الاحصاء الوصفي (التكرار والنسب المئوية) والاحصاء الاستنتاجي (مربع كاي).

النتائج: من نتائج الدراسة متوسط اختلاف الزيادة في الوزن (كغم) خلال فصول الحمل الثلاثة حسب القيم التالية بعد استبعاد القيم المتطرفة: الفصل الأول (صفر-٠,٦٦ كغم)، الفصل الثاني (٢,٨٣-٣,٥١ كغم)، والفصل الثالث (٤,٩٠-٦,٩٦ كغم). فيما يتعلق بالمشاكل الصحية فقر الدم، هبوط السكر في الدم، ارتفاع السكر في الدم، الزلال في البول بكمية ضئيلة، تسوس الأسنان، التهاب المجاري البولية، الغثيان، التقيؤ، حرقة المعدة. الأنماط الغذائية الشائعة بين الياقعات الحوامل: حذف وجبات غذائية رئيسية، تناول وجبات صغيرة، عدم الرغبة بتناول الطعام وعدم شرب كميات كافية من الماء أو السوائل الأخرى (٦-٨) قذح يوميا. الأغذية المأخوذة خلال ٢٤ ساعة وجدول تكرارها لا تسد الاحتياجات اليومية من الحصص الغذائية بعد مقارنتها بالحصص الغذائية في الهرم الغذائي.

التوصيات: أوصت الدراسة بتصميم وتقديم برامج تعزيز الصحة والتثقيف التغذوي للياقعات لتضبيرهن لزواج وحمل صحيين.

Abstract:

Objectives: The study aims to assess the nutritional status, identify nutrition-related health problems and find out the relationships between nutritional status and demographic characteristics of the pregnant adolescents in Baghdad City.

Methodology: A descriptive study was carried out from April/20/2009 to June/30/2009 through a "Non-probability" purposive sample of (196) pregnant adolescents their age between (13-19) years who attend (14) primary health care centers in Baghdad City seeking for antenatal care. The data were collected by the investigator who interviewed the pregnant adolescents and filled out the constructed questionnaire formats which designed for the purpose of the study. Internal consistency of reliability determined through the computation of alpha-Chronbach correlation coefficient for quality of life items. Test-retest of reliability was determined through the computation of Spearman's correlation coefficient for the same items. The content validity of the constructed questionnaire was determined through a panel of experts. Data were analyzed through the application of descriptive statistical approach (frequencies and percentages) and inferential statistical approach (Chi-Square).

Results: The findings revealed that imparity in weight per (kg) according to the pregnancy trimester recorded the following mean values (after excluding the extreme values). 1st trimester (0.00 – 0.66kg), 2nd trimester (2.83 – 3.51kg) and 3rd trimester (4.90 – 6.96kg). Regarding nutritional related problems; anemia, hypoglycemia, hyperglycemia, protein urea (trace), teeth decay and urinary tract infection, nausea, vomiting, and heartburn. Common dietary patterns: skipping meals, snacks eating, food dislike, and not drinking enough amounts of water or beverages daily(6-8) glasses, The dietary intake through the (24) hours diet recall and food frequency questionnaire which in comparison with food pyramid do not meet daily requirements of their servings.

Recommendations: The study recommends health promotion and nutrition-oriented education programs can be designed, structured and presented to female adolescents to prepare them for a healthy marriage and pregnancy.

Key words: Nutritional status, Pregnant Adolescents

Introduction:

The nutrition is considered as one of the most important factors influencing the quality of human life worldwide. Also, it is directly related to retardation of growth and development, decrease resistance of infection and environmental hazards.

When the nutritional deficit is severe and long enough, the gain in weight and height will be retarded ⁽²⁾.

Adolescence is one of the most challenging periods in human development. The relatively uniform growth of childhood is suddenly altered by a rapid increase in the growth rate. These sudden changes create special nutritional needs. Adolescents are considered, especially vulnerable nutritionally for several reasons: First, they have an increased demand for nutrients because of the dramatic increase in physical growth and development. Second, the changes in lifestyle and food habits of the adolescents affect their nutrient intake and needs. Third, adolescents have special nutrient needs associated with participation in sports, pregnancy, development of an eating disorder, excessive dieting, use of alcohol and drugs, or other situations common during this period ⁽¹³⁾.

Early pregnancy is considered to be a problem worldwide, in high, middle, or low income populations alike. There may be large difference among countries in the proportion of girls bearing a child before the age of 20. It is estimated that (25%) of women have their first child before the age of 20 ⁽⁴⁾.

Adequate nutrition during pregnancy is important to enable the fetus to grow and develop physically and mentally to full its potentials. It is widely believed that fetal nutrition plays a key role in the well-being of the newborn infant, and further influences health during childhood and adulthood, with possible effects into the next generation ⁽³⁾.

Maternal nutrition may also be a key factor influencing the health of women during pregnancy and adult life. During pregnancy women need to avoid food hazards, maintain a healthy immune system and avoid inappropriate anemia. Nutrition during pregnancy may be especially important in adolescent mothers who have not yet completed their own growth ⁽⁸⁾.

Methodology:

A descriptive study started at April 20th, 2009 and finished at June 30th, 2009. The present study is carried out for the pregnant adolescents with different trimesters who attend urban and suburban primary health care centers (PHCCs), which are distributed across seven health districts in Baghdad City.

An assessment tool is constructed in a form of a questionnaire and composed of (8) main parts as follows: demographic characteristics of the pregnant adolescent, medical history, obstetrical history, daily physical activities, dietary patterns, psychological aspect, social aspect, nutrition assessment components (anthropometric measurements, biochemical tests, clinical observations, dietary intake).

Data are collected through review of the clients' medical records to record the results of the laboratory tests such as Hb gm/100ml, PCV %, Fasting blood sugar mg / 100ml, blood group and Rh and general urine exam. Questionnaire interview of clients with clinical observation on individual basis.

Measurements are taken by using Electronic Scale (Seca-Australia) for recording weight per kg and the height is taken using the height board with a horizontal head board that can be brought into contact with the upper point on the head. Dietary intake is assessed by the 24 hours diet recall and food frequency questionnaire.

Results:

Table 1. Demographic characteristics of the studied subjects

Variables	Groups	Frequency	Percent	Cumulative Percent	Comparative significant P-value
Age (years)	14	14	7.1	7.1	$\chi^2=32.49$ P=0.000 HS
	15	29	14.8	21.9	
	16	31	15.8	37.8	
	17	32	16.3	54.1	
	18	31	15.8	69.9	
	19	59	30.1	100	
Level of education	Unable to read and write	4	2	2	$\chi^2=231.7$ P=0.000 HS
	Able to read and write	9	4.6	6.6	
	Primary school graduate	107	54.6	61.2	
	Intermediate school graduate	29	14.8	76	
	Secondary school graduate	39	19.9	95.9	
	Institute graduate , College graduate	8	4.1	100	
Pregnant adolescents Occupation	Private work employee	2	1	1	$\chi^2=302.98$ P=0.000 HS
	Housewife	180	91.8	92.9	
	Student	14	7.1	100	
Spouses' occupation	Government work	76	38.8	38.8	$\chi^2=161.43$ P=0.000 HS
	Private work	108	55.1	93.9	
	Student	5	2.6	96.4	
	Without job	7	3.6	100	
Type of family	Extended family	186	94.9	94.9	Binomial P=0.000
	Nuclear family	10	5.1	100	
Income (Monthly)	A	93	47.4	47.4	$\chi^2=49.91$ P=0.000 HS
	B	84	42.9	90.3	
	C	18	9.2	99.5	
	D	1	0.5	100	
Properties	A	5	2.6	2.6	$\chi^2=267.44$ P=0.000 HS
	B	18	9.2	11.7	
	C	173	88.3	100	
Assets	All	22	11.2	11.2	$\chi^2=125.89$ P=0.000 HS
	Most	139	70.9	82.1	
	Some	35	17.9	100	
Number of persons	2 - 5	20	10.2	10.2	$\chi^2=49.67$ P=0.000 HS
	6 - 9	97	49.5	59.7	
	10 - 19	79	40.3	100	
Number of bedrooms	1 - 2	24	12.2	12.2	$\chi^2=156.89$ P=0.000 HS
	3 - 4	148	75.5	87.8	
	5 - 8	24	12.2	100	

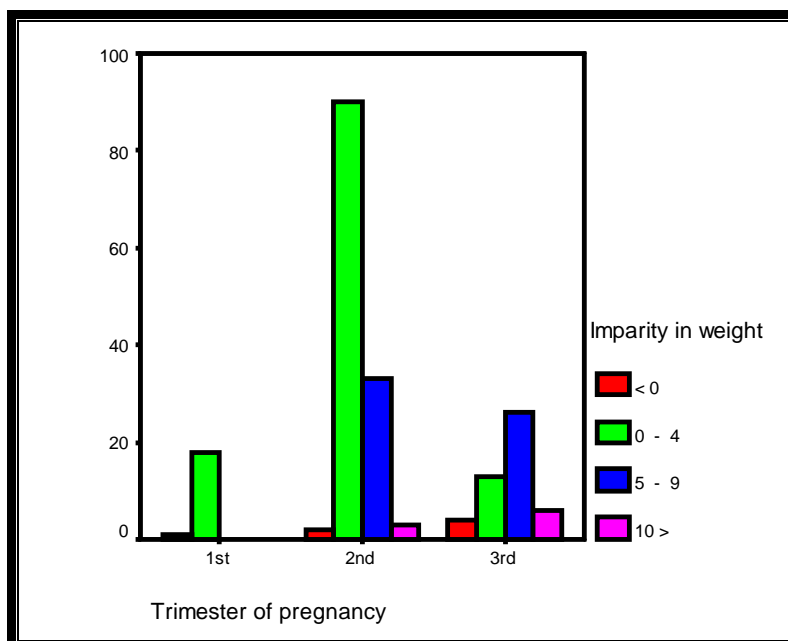
χ^2 =Chi-square, P=Probability, %=Percent, C.C. =Correlation Coefficient level ,HS=Highly Significant

This table presents the demographic characteristics of the studied subjects. The results of this table indicate that the majority of the sample are aged(19)years old (30.1%), primary school graduate(54.6%), housewives(91.8%), living in shared houses (88.3%)with extended families(94.9%), number of persons(6-9)(49.5%), number of bedrooms(3-4)(75.5%)has low monthly income(47.4%), most assets(70.9%), their spouses' occupation is private work(55.1%). In addition to that a highly significant P values are recorded which mean there are different responding frequencies for each sample.

Table 2. Cross tabulation causes correlation among imparity in weight per (kg.) groups and different trimesters

Trimester		Count and Percent	Imparity in weight groups (kg)				Total
			< 0	0 - 4	5 - 9	≥10	
Trimester of pregnancy	1st	Count	1	18	0	0	19
		% within Trimester of pregnancy	5.3%	94.7%	0.0%	0.0%	100.0%
		% within Imparity in weight groups (kg)	14.3%	14.9%	0.0%	0.0%	9.7%
		% of Total	0.5%	9.2%	0.0%	0.0%	9.7%
	2nd	Count	2	90	33	3	128
		% within Trimester of pregnancy	1.6%	70.3%	25.8%	2.3%	100.0%
		% within Imparity in weight groups (kg)	28.6%	74.4%	55.9%	33.3%	65.3%
		% of Total	1.0%	45.9%	16.8%	1.5%	65.3%
	3rd	Count	4	13	26	6	49
		% within Trimester of pregnancy	8.2%	26.5%	53.1%	12.2%	100.0%
		% within Imparity in weight groups (kg)	57.1%	10.7%	44.1%	66.7%	25.0%
		% of Total	2.0%	6.6%	13.3%	3.1%	25.0%
	Total	Count	7	121	59	9	196
		% within Trimester of pregnancy	3.6%	61.7%	30.1%	4.6%	100.0%
		% within Imparity in weight groups (kg)	100.0%	100.0%	100.0%	100.0%	100.0%
		Total	3.6%	61.7%	30.1%	4.6%	100.0%
			$\chi^2=42.831$ P=0.000		C.C.=0.423 P=0.000		

χ^2 =Chi-squared test, P=Probability level, %=Percent, C.C. =Correlation Coefficient level, Kg=Kilogram



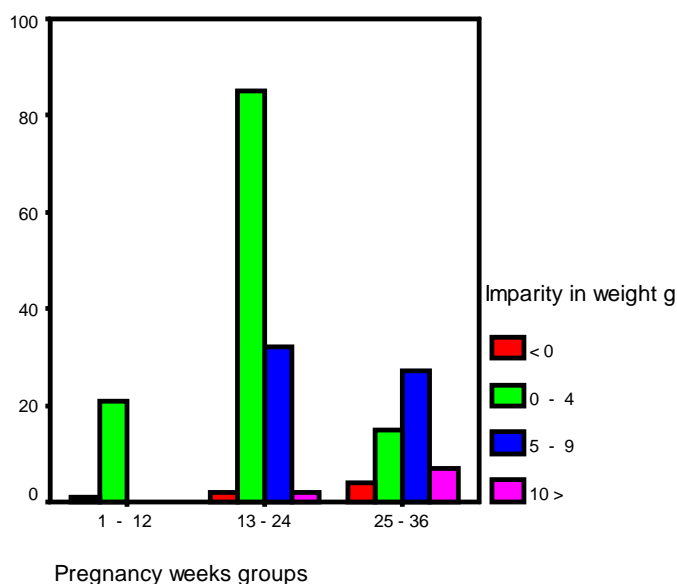
This table shows a contingency of the cause's correlation study. The table represents two dimensions that permit cross-tabulations of the frequencies of the categorical factors to communicate a lot of information. In this study a contingency table is applied after transforming the ordinal scale of the imparity in weight groups (kg) within four intervals (the difference between the weight when enter the pregnancy and the day of the visit {(< 0) wt loss, (0-4), (5-9) and (≥10).

Table 3. Cross tabulation causes correlation among imparity in weight per (kg.) and different pregnancy per (weeks) groups

weeks		Count and Percent	Imparity in weight groups (kg)				Total
			< 0	0 - 4	5 - 9	10 ≥	
Pregnancy weeks groups	1 - 12	Count	1	21	0	0	22
		% within Pregnancy weeks groups	4.5%	95.5%	0.0%	0.0%	100.0%
		% within Imparity in weight groups (kg)	14.3%	17.4%	0.0%	0.0%	11.2%
		% of Total	0.5%	10.7%	0.0%	0.0%	11.2%
	13 - 24	Count	2	85	32	2	121
		% within Pregnancy weeks groups	1.7%	70.2%	26.4%	1.7%	100.0%
		% within Imparity in weight groups (kg)	28.6%	70.2%	54.2%	22.2%	61.7%
		% of Total	1.0%	43.4%	16.3%	1.0%	61.7%
	25 - 36	Count	4	15	27	7	53
		% within Pregnancy weeks groups	7.5%	28.3%	50.9%	13.2%	100.0%
		% within Imparity in weight groups (kg)	57.1%	12.4%	45.8%	77.8%	27.0%
		% of Total	2.0%	7.7%	13.8%	3.6%	27.0%
Total	Count	7	121	59	9	196	
	% within Pregnancy weeks groups	3.6%	61.7%	30.1%	4.6%	100.0%	

	% within Imparity in weight groups (kg)	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	3.6%	61.7%	30.1%	4.6%	100.0%
		$\chi^2=45.381$ P=0.000			C.C.=0.434 P=0.000	

χ^2 =Chi-squared test, P=Probability level, %=Percent, C.C. =Correlation Coefficient level, Kg=Kilogram



This table represents a contingency of the two factors, imparity in weight groups per (kg) and pregnancy week's groups of the studied sample. The results show that a highly significant correlation causes are recorded at ($p < 0.01$) which indicate that with increasing pregnancy period in weeks groups, the imparity in weight toward pregnant adolescents would be increased too.

Table 4. Summary statistics of the imparity in weight per (kg) for the three trimesters and for the total pregnancy's period

Imparity in weight (kg)	Frequency	Mean	Standard Deviation	Standard Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1st	19	0.42	1.02	0.23	-0.07	0.91	-2	3
2nd	128	3.23	2.44	0.22	2.81	3.66	-4	12
3rd	49	5.77	4.55	0.65	4.46	7.07	-7	18
Total	196	3.59	3.37	0.24	3.12	4.07	-7	18

This table shows the summary of the statistics of the imparity in weight per (kg) for the three trimesters according to (Mean, standard deviation, standard error, (95%) confidence interval for mean and minimum, maximum readings). The results show that with the 1st trimester the imparity criteria recorded small grade that ranged between (- 2, 3) kg. In addition to that, a highly dispersions are obtained among those pregnant adolescents who are completed that trimester who form about (10%) of the total sample. about (10%) of the total In the 2nd trimester, the imparity in weight (kg) is recorded and express a normal increase according to the mean value, with highly range of weight

gain between (-4, 12) kg. In addition to that, the percentage of this period obtain about (65 %) of the total sample. Finally, the 3rd trimester is recorded a high grade of imparity in weight (kg) according to the mean value and it is related to the dispersion criteria. The result shows a high range of the imparity readings in the interval (-7, 18)(kg) include an extreme outliers responding. In other words, the study concludes that a non-homogeneity in the imparity criteria along the different three trimesters which indicates a different responding in the weight factor toward pregnant adolescents which interprets the high differences in their nutritional status.

Table 5. Exploring the behavior of the imparity in weight per (kg.) interval (standardized) responding for each trimester of pregnancy towards 95% confidence interval of mean values by excluding the extreme values

Bound	Trimesters		
	1st	2nd	3rd
Lower bound	≥ 0.00	≥ 2.83	$\geq +4.90$
Upper bound	$\leq +0.66$	$\leq +3.51$	$\leq +6.96$

This table contains the standard values of the imparity in weight (kg.) intervals for each trimester of the adolescent pregnancy towards 95% confidence intervals of mean values by excluding the extreme values.

Table 6. Distribution of some laboratory tests related to the pregnant adolescents

Test	Score	Frequency	Percent	Cumulative Percent	C.S. P-value
Hb or PCV	Normal	146	75	75	P=0.000
	Mild Anemia	30	15	90	
	Moderate Anemia	20	10	100	
	Total	196	100		
Blood sugar	Abnormal-Lower bound	7	18.4	18.4	P=0.000
	Normal	27	71.1	89.5	
	Abnormal-upper bound	4	10.5	100	
	Total	38	100		
Sugar in urine	Negative	109	94.8	94.8	P=0.000
	Trace	6	5.2	100	
	Total	115	100		
Protein in urine	Negative	107	93	93	P=0.000
	Trace	8	7	100	
	Total	115	100		

P=Probability level , C.S.=Comparative Significant , Hb=Hemoglobin, PCV= Package Cell Volume

This table indicates the following findings : Hb or PCV% : 75% normal, 15% mild anemia, 10% moderate anemia, fasting blood sugar for (38) pregnant adolescents reveal that (18.4%) of the sample are with abnormal-lower bound and (10.5%) with abnormal-upper bound sugar in urine; trace (5.2%), protein in urine; trace (7%).

Table 7. Distribution of some clinical observations related to the pregnant adolescents

Sign	Score	Frequency	Percent	Cumulative Percent	C.S. P-value
Pallor	Yes	69	35.2	35.2	P=0.000
	No	127	64.8	100	
Pale conjunctiva	Yes	44	22.4	22.4	P=0.000
	No	152	77.6	100	
Teeth decay	Yes	50	25.5	25.5	P=0.000
	No	146	74.5	100	
Thyroid enlargement	Yes	2	1	1	P=0.000
	No	194	99	100	

P=Probability level , C.S.=Comparative Significant

This table indicates the presence of some clinical features in some of the studied pregnant adolescents such as pallor (35.2%), pale conjunctiva (22.4%), teeth decay (25.5%) and thyroid enlargement.

Table 8. Distribution of food types consumption by the pregnant adolescents

Food types	Groups	Frequency	Percent	Cumulative Percent
Bread	(1_5)/day	195	99.5	99.5
	(1_4)/wk	1	0.5	100
Rice	(1_5)/day	70	35.7	35.7
	(1_4)/wk	125	63.8	99.5
	(1_2)/mo	1	0.5	100
Pasta	(1_5)/day	7	3.6	3.6
	(1_4)/wk	125	63.8	67.3
	(1_2)/mo	32	16.3	83.7
	None	32	16.3	100
Potato	(1_5)/day	83	42.3	42.3
	(1_4)/wk	101	51.5	93.9
	(1_2)/mo	1	0.5	94.4
	None	11	5.6	100
Vegetables	(1_5)/day	180	91.8	91.8
	(1_4)/wk	13	6.6	98.5
	(1_2)/mo	3	1.5	100
Leafy vegetables	(1_5)/day	93	47.4	47.4
	(1_4)/wk	94	48	95.4
	(1_2)/mo	4	2	97.4
	Never	5	2.6	100
Fruits	(1_5)/day	69	35.2	35.2
	(1_4)/wk	126	64.3	99.5
	(1_2)/mo	1	0.5	100
Dates	(1_5)/day	11	5.6	5.6
	(1_4)/wk	46	23.5	29.1
	(1_2)/mo	52	26.5	55.6

Table 8. Continued

	None	87	44.4	100
Eggs	(1_5)/day	82	41.8	41.8
	(1_4)/wk	94	48	89.8
	(1_2)/mo	2	1	90.8
	None	18	9.2	100
Red meat	(1_5)/day	26	13.3	13.3
	(1_4)/wk	153	78.1	91.3
	(1_2)/mo	7	3.6	94.9
	None	10	5.1	100
Fish	(1_4)/wk	61	31.1	31.1
	(1_2)/mo	105	53.6	84.7
	None	30	15.3	100
Poultry	(1_5)/day	4	2	2
	(1_4)/wk	179	91.3	93.4
	(1_2)/mo	11	5.6	99
	None	2	1	100
Nuts	(1_5)/day	14	7.1	7.1
	(1_4)/wk	108	55.1	62.2
	(1_2)/mo	40	20.4	82.7
	None	34	17.3	100
Dry beans	(1_5)/day	10	5.1	5.1
	(1_4)/wk	168	85.7	90.8
	(1_2)/mo	18	9.2	100

This table shows the frequency of foods consumption by the studied pregnant adolescents and the results come as follows: bread(1-5)times/day, vegetables(1-5) times/day, rice(1-4)times/week, pasta(1-4)times/week, potato(1-4)times/week, leafy vegetables(1-4)times/week, fruits(1-4)times/week, eggs(1-4)times/week, red meat(1-4) times/week, poultry(1-4)times/week, nuts(1-4)times/week, dry beans(1-4)times/week, dates(1-2)times/month, fish(1- 2)times/month.

Discussion:

Anthropometric measurements / Weight measurements:

The results of the interaction between the two factors (trimester periods and imparity in weight) by the distribution of the observed frequencies that they have been occurred are extremely different compared to their expected outcomes, and that indicates the difference between imparity in weight (kg) along the different periods of pregnancy trimesters. In addition to that, a highly significant at ($p < .01$) is recorded within a causative correlation (i.e contingency coefficient). In other words, the results of the observed frequencies increase in the imparity of classes grades whenever there is progress in the trimester periods.

Maternal weight gain is attributable both to increases in maternal weight (increase circulating blood volume, breast mass, uterine size) and fetoplacental growth within the uterus (increased size of fetus, placenta, and amniotic fluid volume) during pregnancy. Current weight should also be measured and rate of weight gain assessed at each visit ⁽⁷⁾.

Most of the previous research works studying the weight and/or height of the pregnancy (i.e. BMI) and taking into account the adolescence period are dealing with the enter time of pregnancy and do not conduct the research during the different trimesters of pregnancy ⁽¹⁾.

It is then particularly important that underweight women increase their energy intake to gain the prescribed 10 to 14 kg

during pregnancy; depending on their height (e.g. taller women should strive for a weight gain of 14 kg.). In addition gestational weight gains as high as 18 kg have been suggested for undernourished women ⁽⁶⁾.

Women with a pre-pregnancy BMI > 25 tend to have babies with high birth weights, even when those women have relatively low gestational gains (As this may lead to problems during delivery, it is likely that such women will be better off gaining weight at, or somewhat below the limit of 10 to 14 kg which is the range recommended for women with normal BMI ⁽¹²⁾).

In accordance with what is mentioned above, the study concludes that the parity augmentation in pregnant women during the different periods of gestation ought to be depending on the increments occurrences in their weight during the pregnancy periods (i.e. in the three distinguished trimesters) and not on the total growth in their BMI indicator.

Biochemical tests: The following laboratory indices are particularly relevant in assessing the nutritional status of the pregnant adolescents: Hemoglobin and hematocrit: The most common nutritional complication of pregnancy is anemia. Routine laboratory tests for anemia include hemoglobin or hematocrit. Serum ferritin can be used to estimate iron reserves. It can also be used to confirm that anemia is due to iron deficiency versus a deficiency in other nutrients. Glucose screen: A fasting test between 24 and 28 weeks of gestation is usually recommended to screen for gestational diabetes mellitus. Urinary ketones: The presence of ketones in the urine should be assessed in adolescents with weight loss ⁽¹⁴⁾.

Clinical Observations: Clinical signs of poor nutritional status are: skin; rough, dry, scaly, pale, pigmented, irritated and petechia. Neck glands; thyroid enlarged. Teeth; unfilled cavities, absent teeth, worn surfaces, mottled and malpositioned. Eyes; dryness, signs of infection, increased vascularity, thickened conjunctiva ⁽¹⁵⁾.

Dietary Intake and patterns: The recorded results of the dietary patterns, the 24 hours

diet recall and the food frequency questionnaire indicate that the pregnant adolescents have skipping meals, food dislike, they drink insufficient amount of water or beverages daily, they eat less number of daily food servings comparing with food pyramid during pregnancy and adolescence periods.

Adolescent girls who are pregnant must fulfill the dietary requirement imposed by growth associated with their age, in addition to the extra demands of pregnancy ⁽⁵⁾.

A sample diet for normal pregnancy is based on the food pyramid and should include (6-11) servings of carbohydrates like grains, pasta, bread, (3-5) servings of dairy (3-5) serving of meats, beans, nuts and (1) serving of sweets ⁽⁹⁾.

Fluids are essential for the cells, blood, lymph, amniotic fluid and also aids in maintaining body temperature. A good fluid intake promotes good bowel function, which is sometimes a problem during pregnancy. The recommended dietary intake is about (6-8) glasses (1500-2000) ml. Water, milk and fruit juices are good sources. Dehydration may increase the risk of cramping, contractions and preterm labor ⁽¹⁰⁾.

A Nigerian study ⁽¹¹⁾ is carried out during the third trimester of pregnant adolescents to assess their food and nutrient intakes reveals that (32.3%–39.3%) of the recommended daily allowance for iron is met by the subjects. Approximately 30% of subjects individually achieve 100% of the recommended levels of zinc. Mean intake as percentages of the recommended daily allowance by adolescent subjects are 50.7% for calcium, 29.2% for copper and 28.5% for folate.

Recommendations:

Health promotion and nutrition-oriented education programs can be designed, structured and presented to female adolescents to prepare them for a healthy marriage and pregnancy.

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