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Assessment of the Nutrition and Dietary Status During Pregnancy

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Abstract: The Objective of the study Is to assess the nutrition during pregnancy in Saudi women. It is a cross-sectional descriptive study conducted to collect, describe and analyze the nutritional status during pregnancy, performed on pregnant women.(May 2016 - July 2016). (210) patients selected from the antenatal clinic KAUH. Inclusion criteria include pregnant women, not in a special diet, and willing to participate. The ethics committee of KAU approved the study. Data collected using a Questionnaire (Food Frequency Questionnaire) developed and validated in English language. The questionnaire proposed, used as an indicator of a healthy nutritional diet. Which include eight questions. Results; The total number questionnaires (187) were ready for analysis the positive response rate was only (89.1%). The mean ± stander deviation of age (28.79 ± 5.418), Gravidity (2.98 ± 2.180), Gestational Age (29.42 ± 7.920). The mean of hemoglobin (9.79 ± 1.49), and BMI range from 14 – 45 with a mean of (27.33 ± 6.59). When analyzing the questionnaires pregnant women divided into two group. Group 1 (171) those women who consumes healthy diet (eight questions answered yes) and Group 2 only 16 pregnant women out 187 (8.56%) consumes a poor diet. (25.7%) had hemoglobin was less than 9mg/dL. The group the poor diet had more small baby which was statistically significant with $P < 0.026$. Comparing the two groups the fetal complication were statistically significant higher in the poor diet group, with a p value < 0.004 with OD ratio 95% confidence limit 7.318 (2.128-25.166). The level of hemoglobin were less than 10 mg/dL 0.280 (0.087 - 0.902) $P < 0.022$. The MBI less than 25 with ODs ratio and 95% cl 0.364 (0.121 - 1.092) and $p < 0.54$. In conclusion, our sample of Saudi pregnant women only 8.56%, and 25.7% their hemoglobin were less than 9gm/dL and their BMI were 27. 33. Poor diet affect only the level of hemoglobin and fetal weight at delivery.

Keywords: Nutrition, Pregnancy, Saudi Arabia

1. Introduction

Pregnancy considered a critical stage of life for both mother and fetus. It needs attention in term of health, exercise and nutrition. [1]. Women's nutrition is a major public health issue, it involve nutrition for Adolescents, preconception and women during pregnancy and lactations. [2]. It has a tremendous effect on women health as well as the health of the Future generations. Nutritional status has an influence on reproductive status such as age at menarche, fetal growth and birth weight, women's ability to go through health pregnancy and save lactation Malnutrition in pregnancy impairs the mothers owns health and has an ill effect on the newborn. [3]. Not only adequate nutrition is essential for fetal development but also a balanced nutrition intake in the diet of the women before and during pregnancy has a significant implication for the baby birth weight, fetal programming of non-communicable diseases and their response to subsequent illness. [4]. The aim is assessment of the nutritional status of Saudi pregnant women.

2. Materials and Methods

A cross-sectional descriptive study conducted to collect, describe and analyze the nutritional status during pregnancy. The survey performed on volunteer's pregnant women. From May 23, 2016, to July 28, 2016, (210) patients selected from the outpatient's antenatal clinic at King Abdulaziz University Hospital.

All participants of the study signed an informed consent. Inclusion criteria include pregnant women, not in a special diet, and willing to participate. The ethics committee of KAU approved the study. Data collected using a Questionnaire (Food Frequency Questionnaire) - which is a simple, brief that administered through an interview, which was originally developed and validated in English language. Consist of age in years, Gravidity, Gestational Age in weeks, history of taking any supplement, Educational Status, Past Medical, Surgical and Social History. (Height, Weight, BMI) Hemoglobin and fetal weight, fetal and maternal complications. Data after follow up and delivery recorded from the medical chart.

To determine the frequency of consumption of different types of categories of Saudi diet, which collected from pregnant women by (Food Frequency Questionnaire). The assessment method is to determine the frequency and not the portion size by describing all foods and beverages consumed in the past 24 hours to a week.

The questionnaire proposed, used as an indicator of a healthy nutritional diet. Which include eight questions; 1) Do you eat meat or chicken at least 2-3 times per week. 2) Do you eat at least 5-7 portions of fruit and vegetables per day? 3) Do you eat fish at least 1-2 times per week? 4) Do you consume dairy products (milk, cheese, yoghurt) every day? 5) Do you eat whole grain carbohydrate foods (brown bread, brown pasta, brown rice or other) at least once a day? 6) Do you consume packaged snacks, cakes, pastries or sugar-sweetened drinks less than five times a week? 7) Are you taking folate/folic acid, iron and calcium supplements. 8) Do you get regular exposure to the sun? Healthy diet if all answer is yes; otherwise, it is a poor diet

Ethical approval obtained from King Abdulaziz University IRB and the methods carried out in "accordance" with the approved guidelines. Authors have no conflict of interests, and the work not supported, or funded by any drug company.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA), version 20.0 used to analyze data using chi-square test. The frequency of occurrence of different variables calculated P Value less than 0.05. Odds ratio and 95% confidence limits used.

3. Results

The total number of patients selected was 210, and only 187 questionnaires were ready for analysis the positive response rate was only (89.1%). Their mean ± stander deviation of age were (28.79 ± 5.418), and Gravidity (2.98 ± 2.180), Gestational Age (29.42 ± 7.920). The average hemoglobin (9.79 ± 1.49), and BMI range from 14 – 45 with a mean of (27.33 ± 6.59). Table 1.

Table 1. *Baseline Characteristics.*

	Minimum	Maximum	Mean	St.Dev.
Age	19	41	28.79	5.418
Gravidity	1	12	2.98	2.180
Gestational age	10	42	29.42	7.920
BMI	14	45	27.33	6.59
HB	6	14.20	9.79	1.491
Fetal weight	1700	4000	2857.06	578.97

Age = in years; Gestational age = in weeks; BMI = Body mass index; HB = hemoglobin gm/dL; Fetal weight = in gram; Std. = stander deviation

When analyzing the questionnaires pregnant women divided into two group. Group 1 (171) those women who consumes healthy diet (eight questions answered yes) and Group 2 only 16 pregnant women out 187 (8.56%) consumes a poor diet this according to our indicator. (Limitation that the questionnaire does not reflect the women who are eating too much because the portion size is not included only the type of food). The number of pregnant women and their gestational age at the time of the questionnaire. Table 2.

Table 2. *Gestational age in weeks the number of pregnant women and their gestational age at the time of the questionnaire.*

Gestational age	Frequency	Percentage
<28	72	38.5
28-32	41	21.9
32- 36	33	17.6
>36	41	21.9
Total	187	100

Gestational age = in weeks

When the two groups compared in an age in years, gravidity, Gestational Age and BMI there was no statistically significant difference in all except in the level of hemoglobin in mg/dL it was with statistically significant difference with a p-value < 0.017. Table 3.

Table 3. *Compering the mean of patients characteristic in Group 1 a healthy diet and Group 2 poor diet.*

	Healthy diet N=171 (Mean ± std.dev)	Poor N=16 (Mean ± std.dev)	p
Age	(28.77 ± 5.56)	(29.00 ± 3.87)	< 0.87
Gravidity	(2.93 ± 2.12)	(3.50 ± 2.73)	< 0.32
Gestational age	(29.31 ± 7.87)	(30.56 ± 8.43)	< 0.55
BMI	(27.26 ± 1.50)	(28.11 ± 7.44)	< 0.62
Hemoglobin	(9.87 ± 1.49)	(8.94 ± 1.23)	< 0.017

Age = in years; Gestational age = in weeks; BMI = Body mass index; Hemoglobin = in gm/dL; Fetal weight = in gram; N = number; Std. = stander deviation; P value =< 0.05 (Statistically Significant)

Out of 187, 48 patients (25.7%) their hemoglobin was less than 9mg/dL, and when we compare the level of Hb, in women consuming healthy diet with those with poor diet, there was statistically significant with p<0.04. Then we found that the fetal weight recorded after delivery with a (mean ± stander deviation) (2857.06 ± 578.97). In table 4 show in comparison fetal weight in gram in both group the poor diet has more small baby which was statistically significant with P < 0.026. Table 4

Table 4. *The level of hemoglobin and fetal weight in both group.*

Variable	Number	Percentage	Healthy diet	Poor diet	P
Hemoglobin (gm/dL)					
>10	97	51.9	93	4	< 0.040*
10 - 9	42	22.5	38	4	
9 - 8	32	17.1	25	7	
8 - 7	13	7.0	12	1	
< 7	3	1.6	3	0	
Fetal weight (gram)					
>4000	11	5.9	10	1	< 0.026*
4000-3500	23	12.3	21	2	
3500-3000	56	29.9	55	1	
3000-2500	36	19.3	35	1	
2500-2000	58	31	48	10	
<2000	3	1.5	2	1	
Total	187	100	171	16	

P value =< 0.05 (Statistically Significant); (*) = (Statistically Significant)

Risk factor for poor nutrition such as age >35 years, primigravida, low level of education, positive medical, surgical and social history, none of this factor found to affect the frequency of food indicating that they a have a good nutritional diet Table 5.

Table 5. *Comparing both group in regard age > 35, gravidity, educational level.*

Variable	Healthy diet N (171)	Poor Diet N (16)	O. R 95% confidence limit (lower – upper)	P
Age				
<35	144	15	0.356 (0.045 - 2.805)	0.272
>35	27	1		
Gravida				
Primi	48	3	1.691 (0.461- 6.198)	0.317
multi	123	13		
Educational				
<high school	66	6	1.048 (0.364 - 3.018)	0.579
More	105	10		
Medical history				
No	141	14	0.671 (0.145 - 3.1100	0.461
Yes	30	2		
Surgical history				
No	96	10	0.768 (0.267 - 2.208)	0.414
Yes	75	6		
Smokers				
No	139	13	1.002 (0.270 - 3.726)	0.608
Yes	32	3		

N = number; Std. = stander deviation; P value =< 0.05 (Statistically Significant); O. R = odds ratio 95% confidence limit (lower – upper); Primi = primgravida; Multi = multigravida

When to compare the two groups regarding the supplement there was no statistically significant difference in the two-group. Table 6.

Table 6. *The use of micronutrients (folic acids, iron and calcium) in both group.*

Variable	Healthy diet N (171)	Poor Diet N (16)	O.R 95% confidence limit (lower – upper)	P
Folic acids				
No	12	1	1.132 (0.138 - 9.315)	0.693
Yes	159	15		
Fe++				
No	30	4	0.638 (0.193 - 2.115)	0.326
Yes	141	12		
Ca++				
No	29	4	0.613 (0.185 - 2.034)	0.305
Yes	142	12		

N = number; Std. = stander deviation; P value =< 0.05 (Statistically Significant); O. R = odds ratio 95% confidence limit (lower – upper); Fe ++ = iron supplement; Ca++ = Calcium supplement

Comparing the two groups the fetal complication were statistically significant higher in the poor diet group, with a p value < 0.004 with OD ratio 95% confidence limit 7.318 (2.128-25.166). The level of hemoglobin were less than 10 mg/dL 0.280 (0.087 - 0.902) P < 0.022. The MBI less than 25 with ODs ratio and 95% cl 0.364 (0.121 - 1.092) and p < 0.54. **Table 7**

Table 7. *Comparing maternal, fetal complications-fetal wight-hemoglobin and BMI.*

Variable	Ideal diet N (171)	Poor Diet N (16)	O. R 95% confidence limit (lower – upper)	P
Maternal complication				
No	126	12	0.933 (0.286 - 3.042)	0.587
Yes	45	4		
Fetal complication				
No	161	11	7.318 (2.128 - 25.166)	0.004*
Yes	10	5		
Fetal weight				
<2500	57	11	0.227 (0.075 - 0.685)	0.006*
>2500	114	5		
Hemoglobin				
<10	78	12	0.280 (0.087 - 0.902)	0.022*
>10	93	4		
BMI				
<25	76	11	0.364 (0.121 - 1.092)	0.050*
>25	95	5		

P value =< 0.05 (Statistically Significant)
(*) = (Statistically Significant)

4. Discussion

Poor Nutrition means a diet with an imbalance or insufficient food intake such as one of the components is not present, Healthy Nutrition means a diet with a well-balanced food that provides all essential nutrients necessary for growth, function, and health [5]. Healthy nutrition for women before and during pregnancy can influence pregnancy outcomes, including fetal growth restriction, diabetes, hypertension, and preterm delivery. [6].

In our study, we consider a healthy balance diet when pregnant women are enjoying fruits and vegetables of different types at least 5-7 types /day. [7]. Whole grain carbohydrate foods (brown bread, brown pasta, brown rice or other), a whole grain and high fiber options at least once a day [8].. Choosing foods that are high in iron, essential for pregnant women such as eating meat or chicken at least 2-3 times per week, fish at least 1-2 times per week [9]. [10]. [11]. Consume products (milk, cheese, yoghurt) every day, making a habit of drinking milk, and eating hard cheese and yoghurt, or calcium-enriched alternatives. Reduced-fat varieties are best. [12].. Drinking more than 1000 ml of water per day)[13].. Snacks, cakes, pastries or sugar-sweetened drinks which high in saturated fat should be used less than five times a week and it is not a necessary part of a healthy diet and should be limited. [14].

In Mexico, 20.6% of pregnant women suffer from anemia [15]., in another study out of the 305 pregnant registered women with iron deficiency anaemia most women were young 170 (55.73%) between 20-30 years. [16]. In our study 25.7% of pregnant women their hemoglobin were less than 9 /dL. According to the WHO'S, iron and folic acid are recommended to reduce the risk of iron deficiency anemia, which is prevalent among pregnant ladies [17]. Fetal birth weight is directly proportional to maternal health and nutritional status. As a result, birth weight is an important determinant of the newborn survival, healthy growth and development.

Accordingly, reduced fetal growth has been related to maternal under nutrition. On 2009 Kapil found that about 22% of babies born in India are born with low birth weight. [18]. In our study 32.5% their weight less than 2500 gm. Mother's age, mother's education, or husband's education were not associated with any of the food habits during pregnancy. Given the importance of nutritional value and composition of foods consumed during pregnancy and lactation, health workers should use these findings to provide appropriate nutrition counseling and education. [19]. It was found that there is a relation between dietary patterns during pregnancy and postpartum depression and that more consumption of fish, dairy olive oil and fruit & vegetables. Also, there was some evidence showing the decrease in upper respiratory tract infection among pregnant women. [20] [21] [22]. The variety of food or diet did not differ according to occupation or income in a group of the Japanese family, the mother's iron status reflect on her newborn infant iron status and growth. health education and distribution of knowledge regarding healthy balance diet during pregnancy and Peripartum may help eliminate myths and avoid of individual dietary components. [23] [24] [25] [16].

5. Conclusion

In our sample of Saudi pregnant women only 8.56%, and 25.7% their hemoglobin were less than 9gm/dL and their BMI were 27. 33. Poor diet affect only the level of hemoglobin and fetal weight at delivery

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