Nutritional Awareness of Women during Pregnancy

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Abstract: Nutrition throughout life has a major effect on health .This is true for pregnant women as adequate maternal nutrition is one of the best ways to ensure maternal and fetal wellbeing in developed and developing countries. **The aim** of the present study was conducted to investigate the nutritional awareness of women represented in their knowledge, attitude, and the dietary practice regarding the meaning, the importance and constituents of a well balanced diet and the necessary nutrients during pregnancy. **This study** is an observational – cross sectional study. The participants were 124 pregnant females; their ages ranged from 18 to 35 years old, attending the outpatient clinics of obstetrics and gynecology at El-Menshawy General Hospital .**Data** were collected through: An interviewing questionnaire schedule sheet was designed to collect data related to socio-demographic data, general and obstetrical history, data about the present pregnancy and women Knowledge, Attitude, and practices regarding nutrition during pregnancy. **The results** of present study revealed that more than half of women (54%) had a poor level of knowledge and practices regarding the intake of essential nutrients and basic food elements meeting the nutritional demands of the mother and the fetus. They found to be failed to meet their high physiological requirements necessary for themselves and their growing fetus. **It can be concluded that**, most of women had a very poor level of knowledge about nutrition during pregnancy. Where more than half of women in the present study lacked the essential knowledge regarding the basic nutrients and adequate nutrition during pregnancy, also the importance and sources of most of the types of vitamins and minerals and other essential food elements. Unhealthy food practice was also observed among them. **The study recommended that** it is necessary to encourage pre-pregnancy teaching and counseling for future mothers and during early pregnancy about proper and balanced maternal nutrition, also to enforce good prenatal care nutritional counseling of supplementation of iron and folic acid and other basic nutrients that are crucial for the mother and her growing fetus.
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1. Introduction

Nutrition is a fundamental pillar of human life, health and development throughout the entire life span . Proper food and good nutrition are essential for survival, physical growth, mental development, performance and productivity, health and wellbeing (1,2) .

The promotion of women's health and other preventive health care practice should start before birth, during intrauterine life and extends throughout different phases of their lives in order to sustain their general as well as their reproductive health.(2)

The importance of maternal nutrition during pregnancy has long been recognized. The National Academy of Science issued a report that reviewed studies of reproductive experience concluded that: adequate prenatal nutrition was one of the most important environmental factors affecting the health of pregnant women and their babies. (3)

A well balanced diet is a basic part of good health at all times in woman's' life. During pregnancy, mothers' diet is even more important. The foods the mother eats are the main source of nutrients for herself and her baby. (4,5)

Eating well during pregnancy means do more than simply increase how much the mother eats. The mother must also consider what she eats. Although she need about 300 extra calories a day — especially later in her pregnancy, when the baby grows quickly — those calories should come from nutritious foods so they can contribute to mother s' baby's growth and development.(4-6)

The ability of mother to provide nutrients and oxygen for her baby is a critical factor for fetal health and its survival. Failure in supplying the adequate amount of nutrients to meet fetal demand can lead to fetal malnutrition (5,7). The fetus responds and adapts to under nutrition but by doing so it permanently alters the structure and function of the body. Maternal over nutrition also has long-lasting and detrimental effects on the health of the offspring (7,8).

There is growing evidence that maternal nutrition can induce epigenetic modifications of the fetal genome. Only relatively recently has evidence from epidemiological and animal studies emerged suggesting that fetal responses to the intrauterine environment may underlie the prevalence of many chronic diseases of adulthood including Type 2 (non-

insulin-dependent) diabetes(9,10). It is now of crucial importance to gain the understanding of the molecular mechanisms underlying the relationship between fetal alterations to the intra-uterine environment and their long-term effects on the health of an individual. (10,11).

So, it is necessary that maternity and community health nurses as nutritional counselors can increase the expectant mothers' knowledge and dietary practice regarding the function of the basic nutrients and metabolism, the selection of an adequate well balanced diet, the daily dietary recommendations and the alternative food patterns to promote their general and reproductive health and also to reduce maternal and neonatal mortalities. Therefore, this study aimed to investigate the nutritional awareness of women represented in their knowledge, attitude, and dietary practice regarding the meaning, the importance and constituents of a well balanced diet and the necessary nutrients during pregnancy.

2. Subjects & Methods

The study design:

This study is an observational – cross sectional study.

Target population and settings:

The study subjects were the pregnant women attending the outpatient clinics of obstetrics and gynecology at El-Menshawy General Hospital in both of the free charged and economic sectors, in Tanta city.

Study population and sampling:

The participants were pregnant females, their ages ranged from 18 to 35 years old.

The study sample was chosen as a systematic random sample, where as one pregnant female was interviewed every 3rd pregnant attending the outpatient clinic of obstetrics and gynecology.

All of participants received a full explanation of the objectives of the study before accepting to participate in this work. During the two months period of the study, one hundred and seventy three were interviewed, twenty were interviewed for a pilot study, twenty nine of them were not cooperative and excluded, and the remaining one hundred and twenty four (N = 124) who accepted and completed the questionnaire were the total studied population in this study.

Data collection:

The study was conducted from 1st of January, 2011 for a period of 2 months, three times per week.

A pilot study was conducted among 20 pregnant females initially to test the designed questionnaire, consequently some questions were cancelled and some others were re-formed. Those participated in the pilot were excluded from the study.

In the base-line interview, there are formed interviewing questionnaire schedule sheets was answered by direct interview with pregnant females. The questionnaire took about 15 to 30 minutes to be filled.

The study questionnaire included the following data:

1- Socio-demographic data: age, residence, level of education (low – intermediate – high), occupation (working – not working).
2- Data about the present pregnancy (obstetric data): gravidity (primigravida or multi-gravida) – history of previous delivery (normal labor – abnormal labor).
3- Medical history: any existing medical illness such as: hypertension, diabetes, tuberculosis, Anaemias, Asthma, either yes or no).
4- Knowledge, Attitude, and practice of nutrition during pregnancy:

a. Knowledge: (14 questions)

Data included Knowledge about

- The good balanced diet.
- The pregnant's diet differs than other diet.
- Proper nutrition is important from the 1st to the last trimester.
- Sources of protein, iron and calcium and their importance for both the mother and baby.
- Importance of vegetables and fruits.
- Dangers of malnutrition for the mother and the baby.

b. Attitude (7 questions): pregnant were asked if they were convinced:

- About the concept of eating for two.
- That overweight during pregnancy may affect their health and their offspring.
- About the impact of malnutrition on both of the mother and her outcomes.
- That pregnant must have much more carbohydrates than non-pregnant.
- If they think that pregnant women must have more proteins of animals' source and plant source as well as more of the milk and milk products, than non-pregnant.

c. Practice (14 questions): pregnant women were asked about their dietary practices.

- If they follow specific dietary regimen during pregnancy.
- If they take iron and calcium tablets.
- The habit of eating more carbohydrates between meals.
- Drinking milk (enough or not).
- Servings of milk products.
- Servings of vegetables and fruits.
- Servings of protein of animal origin and plant origin.

Knowledge, attitude and practice scores:

The knowledge questionnaire consisted of 14 questions. Each one was given two (2) points for correct and complete answers; one (1) point for the correct incomplete answers and a score of zero (0) for the incorrect or (no) answer.

As regards the practice, further 14 questions were designed to assess practices of mothers toward nutrition during pregnancy. The answers were given scores of (2) points for good practice, (1) point for average and zero (0) for bad practice.

The sum of the total scores for either of knowledge or the practice varied from (0 up to 28) points maximum score. The sum of the total knowledge or practice score for each mother was divided by the maximum total score (28) and multiplied by (100) to get percentage of maximum score.

Regarding the attitude, (7) questions were designed; the answers were given (2) points for the answer of yes I think, one point for a little and zero (0) for I don't think. Then the sum of total score of the attitude was divided by the maximum total score (14) then multiplied by 100 to get (%) of maximum score. The Cronbach's alpha reliability coefficient was (0.85), (0.82) and (0.68) for the knowledge, attitude and practice.

Ethical consideration:

Ethical aspect should be considered before starting the study as the following**:**

- No any harm for participant.
- Maintain confidentiality, esteem & dignity of subject.
- Freedom to withdraw from participation any time.
- Informed consent should be obtained from the subjects after explanation the purpose of the study.

Statistical Analysis:

Data were analyzed using SPSS software version 13.0. The *p*-value < 0.05 was taken as a cutoff for statistical significance and all tests were two-sided. The chi-square test and Fisher exact tests were used for comparison among proportions for qualitative data. Both of the t-test and ANOVA F-test were used to compare among two and more than two groups respectively; for numerical data (quantitative data) using their means and standard deviations. Pearson correlation coefficient was used to study the relation between two quantitative variables. Stepwise multiple regression analysis was performed to detect the most significant predictors of knowledge or practice.

3. Results

The present study included 124 pregnant women attending the outpatient clinic of gynecology and obstetrics at Elmenshawy hospital.

Table [1] shows the characteristics of the studied sample. It showed that 41.9% aged ≥ 25years and 36.3 %aged < 25years, with a mean age 26.53±4.57 years. Women with high educational level constituted 45.2% while only 16.1% were of lower educational level. Regarding the residence, slightly more than half of them were urban (51.6%). The majority of them were house wives (71.7%).

It showed also that 40.3% of pregnant women were primigravida, and the others were multigravida, (35.5%) of them had one child and (24.2%) had more than one. About two thirds of women (67.6%) had previous normal delivery while only (32.4%) had previous abnormal delivery. The majority of women (90.3%) had no complains of associated disease.

Table (2), showed that among the knowledge questionnaire; the majority of women (87.1%), had good knowledge score in the 2nd question. In which they knew that women nutrition during pregnancy should differ than that for other women. More than three quarters of women, (78.2%) had a good knowledge about the importance of milk and milk products for pregnant women (the 10th question). The same score (78.2%) was achieved by the 14th question, in which they knew that maternal malnutrition can endanger the newborn health. The least scored questions were for the third (50.8%), followed by the first (54%). In which about half of women didn't know exactly neither the meaning nor the constituents of the balanced diet for the pregnant women. Only (61.3%) had good knowledge about the sources of iron (11th question) and (71.8%) knew the sources of calcium (9th question).

As regards the attitude, less than half of women (40.3%) thought negatively that pregnant women should eat for two (1st question), also (44.4%) thought that most of their diet (>3/4) must be of starchy food (6th question). The majority of women (88.7%) had a positive attitude towards milk and milk products (8th question). Concerning the practice, less than half of women (42.7%) practiced daily servings of milk and milk products (46.8%), in the 8th and 10th questions. As regards animal protein, only (42.7%) practiced daily servings (11th question). Less than two thirds (61.3%) of pregnant women practiced badly the habit of eating much starchy food between meals (5th question). About two thirds of women had a good practice of eating vegetables and fruits between meals (6th question). About 60 % practiced daily eating of enough servings of vegetables and fruits (14th question).

Table (3), showed the inter-correlation between, women's knowledge, attitude and practices of nutrition during pregnancy. It revealed a positive correlation between knowledge and attitude (r=0.120), attitude and practice (r=0.092) and a significant positive correlation between knowledge and practice (r= 0.287, $p<0.01$)

Table [4] shows the distribution of women by their awareness of nutrition by sample characteristics. It showed the knowledge, attitude and practice of pregnant women in association with their characteristics. It revealed that women aged 25-35 years had higher mean (%) of nutritional knowledge, compared to those younger than 25 years and above 35; they were [81.04±16.58 & 81.72±17.63] and [77.30±21.16 & 63.93±26.32] respectively. The differences were not statistically significant. As regards the nutritional practice of women , the highest mean (%) was for those aged 25 to 30 years {61.26±15.98}, however, there were non significant statistical differences between the different age groups regarding their practice {f = 0.55, p> 0.05}. Urban women had higher mean (%) of nutritional knowledge and practices compared to women in rural area, these were [80.75±18.59&61.83±17.00] and [75.89±20.63]& [55.83±17.31], respectively. While the mean positive nutritional attitude of rural women was nearly as same as the mean attitude among urban women. Women with high level of education had high mean (%) of their nutritional.knowledge and practice compared to low and moderate education [84.71±13.54 & 60.90±17.73]. while women with low education had high mean (%) of positive attitude [81.20±16.36]. The difference was statistically significant as regards the knowledge only. The mean (%) of nutritional knowledge, attitude and practice among working women [89.69±11.32 & 75.71±15.71& 61.63±17.09] exceeded those for non-working women [73.96±20.52 &74.72±15.19 &57.87±17.42] respectively. The difference was statistically significant regarding the knowledge (t= 4.28, p<0.05).

Regarding parity, this study revealed minor changes in women's nutritional knowledge, attitude and practices with respect to their number of children. The differences were statistically non significant. Mean (%) of knowledge, attitude and nutritional practice among women with history of abnormal delivery were more than those with normal delivery. [78.57±19.13, 78.27±19.01 &64.29±12.19, and 77.71±19.73, 73.57±13.78 & 58.79±18.74] respectively.

Women with medical history of associated disease, showed a more positive attitude and a better nutritional practice compared to women with no disease, {82.74±16.53& 62.20±15.77 and 74.17±14.98 & 58.58±17.53} respectively.

Table (5) showed multiple regression analysis of women's knowledge and practice in nutrition in association with their characteristics. The most significant predicting factors for knowledge in this study were high education followed by working

[t=4.265, p<0.05 &t=2.845, p <0.05]. The most significant predictor for good nutritional practice was women's knowledge [t=3.315, p <0.05].

4. Discussion

Adequate nutrition is vital throughout the life span .During pregnancy; nutrition plays a key role in achieving an optimum outcome for the mother and her newborn. Motivation to learn about nutrition is usually higher during pregnancy because the mothers strive to do what is right for their baby.

Studies performed on humans indicate that nutrition during pregnancy influences not only on health and neurological development of the newborn, but also the subsequent morbidity and mortality through the life cycle.(11).

Low maternal weight before pregnancy and inadequate weight gain and calories by the expectant mother are all associated with the delivery of low birth weight infants. (Guyton & Hall 12), stated that optimum nutrition could not eliminate all problems that might arise in pregnancy, but it established a good foundation for supporting needs of mother and fetus.

Because of the importance of maternal nutritional status and its great effect on both mother and fetal health .The recent study was conducted to investigate the nutritional awareness of women regarding the meaning, the importance and constituents of a well balanced diet and the necessary nutrients during pregnancy represented in their knowledge, attitude, and their daily dietary practices.

Table 1: Description of the study sample

Age (Years)	NO	%	Mean	±SD
<25	45	36.3		
25-	52	41.9		
30-	17	13.7	26.53	±4.57
35+	10	8.1		
Residence				
Urban	64	51.6		
Rural	60	48.4		
Education				
Low	20	16.1		
Moderate	48	38.7		
High	56	45.2		
Work				
Working	35	28.2		
Non working	89	71.8		
Parity				
0	50	40.3		
1-	44	35.5	1.40	±1.36
3+	30	24.2		
Previous delivery	50	67.6		
Normal	24	32.4		
Abnormal				
Associated disease	112	90.3		
No	12	9.7		
Yes				

Table 2: Knowledge, attitude and practice of the study sample

	Good (Score = 2)		Moderate (Score = 1)		Bad (Score = 0)	
	No.	%	No.	%	No.	%
Knowledge						
1-Good balanced diet	67	54.0	34	27.4	23	18.5
2-Pregnantdiet differ than other dirt	108	87.1	9	7.3	7	5.6
3-Componamnt of balanced diet	63	50.8	39	31.5	22	17.7
4-Proper nutrition is important from1^{est}to last trimester	83	66.9	19	15.3	22	17.7
5-Sources of protein(animal& plants)		69.4	26	21.0	12	9.7
6-Importance of protein for both mother &baby	86	68.5	30	24.2	9	7.3
7-Sorce of vitamins	85	62.9	32	25.8	14	11.3
8-Important fruits &vegetables	78	75.8	22	17.7	8	6.5
9-Source of calcium	94	71.8	17	13.7	18	14.5
10-Important of milk &its products	89	78.2	21	16.9	6	4.8
11-Source of iron	97	61.3	32	25.8	16	12.9
12-Importace of iron to pregnant	76	57.3	25	20.2	28	22.6
13-Danger of malnutrition for pregnant	71	75.0	22	17.7	9	7.3
14-Danger of malnutrition for baby	93	78.2	20	16.1	7	5.6
	97					
Total (Mean ± SD)	78.40 ± 19.68					
Attitude						
1-Conept of eating for two	66	53.2	8	6.5	50	40.3
2-If you rating well healthy diet	58	46.8	37	29.8	29	23.4
3-If malnutrition during pregnancy has effect on mother	112	90.3	10	8.1	2	1.6
4-If malnutrition has effect on fetus or baby	105	84.7	14	11.3	5	4.0
5-The overweight during pregnancy may affect on fetus	56	45.2	38	30.6	30	24.2
6-Pregnant must have more carbohydrate than non pregnancy	43	34.7	26	21.0	55	44.4
7-Pregnant must have more proteins or beans during pregnancy	102	82.3	6	9.7	16	12.9
8-Must have more milk& its products during pregnancy.	110	88.7	12	4.8	2	1.6
Total (Mean ± SD)	75.00 ±15.28					
Practice						
1-If they follow specific dietary regimen during pregnancy.	32	25.8	27	21.8	65	52.4
2-If they take iron &calcium during pregnancy	79	63.7	10	8.1	35	28.2
3-The habits of eating more between meal	62	50.0	35	28.2	27	21.8
a-Eating three meal daily	47	37.9	45	36.3	32	25.8
b-Eating snacks between meals	27	21.8	21	16.9	76	61.3
c-Eating more carbohydrates between meals	81	65.3	32	25.8	11	8.9
4-If following weight during pregnancy	50	40.3	29	23.4	45	36.3
5-Drinking milk daily	53	42.7	45	36.3	26	21.0
6-Number of drinking milk daily	51	41.1	3	2.4	70	56.5
7- Eating milk products daily	58	46.8	47	37.9	19	15.3
8- Number of eating proteins &eggs weekly	53	42.7	35	28.2	36	29.0
9-Eating protein(animal source)daily	53	42.7	48	38.7	23	18.5
10-Eating protein(plant source)daily	74	59.7	41	33.1	9	7.3
11-Eating fresh vegetables daily	73	58.9	42	33.9	9	7.3
Total (Mean ± SD)	58.93 ± 17.34					

Table 3: Inter-correlation of knowledge, attitude and practice of the study sample

		Knowledge	Attitude	Practice
Knowledge	r	1.00		
	P			
Attitude	r	0.120	1.00	
	P	0.184		
Practice	r	0.287	0.092	1.00
	P	0.001*	0.312	

Table (4): Distribution of women by their awareness of nutrition and sample characteristics

		No.	Knowledge (%)		Attitude (%)		Practice (%)	
			Mean	±SD	Mean	±SD	Mean	±SD
Age (Years)	<25	45	77.302	21.16	76.86	14.78	57.22	19.67
	25-	52	81.044	16.58	72.94	15.90	61.26	15.98
	30-	17	81.723	17.63	71.85	11.70	56.72	15.51
	35+	10	63.929	26.32	82.86	17.88	58.21	17.01
F (P)			2.40 (0.071)		1.68 (0.175)		0.55 (0.649)	
Residence	Urban	64	80.75	18.59	74.67	16.98	61.83	17.00
	Rural	60	75.89	20.63	75.36	13.37	55.83	17.31
t (P)			1.38 (0.171)		0.25 (0.802)		1.95 (0.054)	
Education	Below 2^{ry}	20	54.89^{AB}	22.29	81.20	16.36	56.20	16.32
	Secondary	48	80.21^{A}	18.72	74.40	15.37	57.66	17.36
	University	56	84.71^{B}	13.54	73.43	14.59	60.90	17.73
F (P)			22.55 (0.000)*		1.93 (0.150)		0.73 (0.485)	
Work	Working	35	89.69	11.32	75.71	15.71	61.63	17.09
	Non working	89	73.96	20.52	74.72	15.19	57.87	17.42
t (P)			4.28 (0.000)*		0.33 (0.746)		1.09 (0.278)	
Parity	0	50	79.00	20.25	74.86	14.80	56.50	17.73
	1-	44	77.68	21.94	76.79	16.38	60.39	17.70
	3+	30	78.45	15.31	72.62	14.54	60.83	16.23
F (P)			0.05 (0.949)		0.66 (0.517)		0.83 (0.441)	
Previous	Normal	50	77.71	19.73	73.57	13.78	58.79	18.74
delivery	Abnormal	24	78.57	19.13	78.27	19.01	64.29	12.19
t (P)			0.18 (0.860)		1.08 (0.286)		1.51 (0.135)	
Associated	No	112	78.35	19.91	74.17	14.98	58.58	17.53
disease	Yes	12	78.87	18.11	82.74	16.53	62.20	15.77
t (P)			0.09 (0.931)		1.86 (0.065)		0.69 (0.494)	

* $P < 0.05$ (Significant) Means with common superscript are significantly different

Table 5: Stepwise multiple regression analysis of knowledge and practice scores in relation to women characteristics

Model	B	β	t	*P*
Knowledge				
Constant	74.148		7.767	0.000
Education	9.665	0.359	4.265	0.000
Work	10.413	0.239	2.845	0.005
$R^2 = .244$				
Practice				
Constant	39.065		6.324	0.000
Knowledge	0.253	0.287	3.315	0.001
$R^2 = .083$				

The present study revealed that about half of pregnant women aged less than 25 years and their education level was high, while on the other hand only a little percentage were illiterate or just read and write. These findings are in agreement with the study by (Murray &Mckinney (13) who stated that maternal education is very important for the health and welfare of both mother and her baby. Moreover,(Perry & Lowder(14)stated that inadequate maternal education in developing countries was considered as a problem and it placed as a serious handicap in dissimulating information and new ideas.

The results of this study also showed that most of women were housewives and most of them stated that inadequate income considered as one of the main problems affecting the intake of well balanced diet during pregnancy. This may be attributed to the fact that when the majority of them were housewives, the food budget during pregnancy was so serious because the expectant mother would not be able to take the ideal balanced diet, which in turn may lead to many health problems for themselves, and their babies. This is also supported by a study done in (Diane & Margerat(15)which concluded that the pregnant women of low socio economic class were not aware of

the importance of the consumption of a balanced diet during pregnancy. Also, ,(Scott& Kyle (16)and (Springmever& A gopinion (17) stressed that economic status affects the nutritional intake and consequently the outcome of pregnancy.

This study also revealed that about half of women didn't have enough knowledge (they gave incorrect and incomplete answers) regarding the meaning, the importance, and the constituents of a well balanced diet for the pregnant women. They also didn't know exactly different food groups, different food elements, their importance, and their sources such as (calcium & iron).Women in this study lacked the awareness of the consequences of inadequate nutrition during pregnancy on mother and fetus.

Again, more than half of women in the present study lacked also the basic and the essential knowledge regarding the importance and sources of most of the types of vitamins and minerals. This can be attributed to the fact that women lack better access to information about nutrition during pregnancy because they are housewives and they didn't attended ANC with a fair number of visits. However, if mother appreciated the importance of good nutrition during pregnancy, she will plan her diet properly, which will reflected on her pregnancy outcome.(18,19)

In addition, according to (Mulhausler& Adam&McMillan(20) who reported that adequate consumption of basic food elements meeting the nutritional demands of the mother and the fetus. Moreover, maternal nutritional status at conception influences on the maternal and fetal mortality and morbidity. (20, 21)

The findings of this study also illustrated that the majority of the pregnant women had a positive attitude towards milk and milk products, on the other hand, slightly less than half of women believed negatively that pregnant women should eat for two, and that most of their diet must be of starchy food . This can be attributed to the fact that women lacked essential knowledge about the importance and sources of proteins, carbohydrates, all types of vitamins and minerals. This findings is in accordance with (Jane & Nancy (22) who reported that poor iron and folic acid has been linked to preterm births and fetal growth retardation. This is also supported by(Matin &Gronert& Ozanne (23)who concluded that iron deficiency anemia may be due to ignorance and misconceptions which in turn may lead to prematurity, abortions, IUFD, postpartum hemorrhage and infections.

Anemia is common during pregnancy. Iron deficiency anemia is the world's most widespread nutrition disorder affecting developed and developing countries (17,24). It is the most common nutritional problem among women in Egypt; its prevalence reached 35% among pregnant women. The main causes of iron deficiency anemia (IDA) are: poor dietary intake of iron, low iron absorption, parasitic infestation, vitamin A deficiency (VAD), early age of marriage , high birth rates and short birth intervals(24,25).

In contrast, some authors have pointed out that most of the evidences now seem to suggest that protein and carbohydrates content of the diet influence on the incidence of pre-eclampsia, toxemia, anemia and low birth weight (25,26). Again, according to Tanya Jolliffe (27), low birth weight is a sensitive indicator of infant mortality, prenatal handicaps, and poor infant growth.

Concerning the pregnant women dietary practice in the current study, it is showed that most of women had a poor level of knowledge and practices about calcium, zinc and iron. By other words they found to be failed to meet their high physiological requirements necessary for themselves and their growing fetus. This is in line with (Lynna & Jon (28) that stressed the fact that during pregnancy extra calcium is required for fetal bone development. If calcium intake is inadequate to the fetal needs will be met by demineralization of maternal skeleton (24,28).

The present study also revealed that less than half of women practiced daily servings of milk and milk products. It has been stressed that the easiest way of obtaining calcium needed for pregnancy and lactation is from milk. As regards animal protein, only less than half of pregnant women practiced daily servings, Less than two thirds of the pregnant women practiced badly the habit of eating much starchy food between meals. While on the other hand, less than two thirds of women had a good practice of eating vegetables and fruits between meals.

It has been reported that, undesirable attitude and/or health practice may persist in spite of correcting their knowledge regarding adequate nutrition during pregnancy (27-29). The women continue to practice such behaviors because they are insensitive to change and that understanding is not necessarily followed by change. This may be attributed to the believed cultural factors and dietary habits.

Again, the current study presented the inter-correlation (positive correlation) between women's knowledge, attitude and practices of nutrition during pregnancy and also between these variables and sample characteristics: where it is revealed that women aged 25-35 years had higher mean of nutritional knowledge, compared to those younger than 25 years and above 35. However, many authors have mentioned the fact that the prevalence of low birth weight was more encountered among adolescent pregnant women than mature women (29). Moreover, Blount (30), reported that adolescent females were more likely to deliver lower birth weight infant than do women in their twenties and/or thirties.

It is also found that urban women had higher mean of nutritional knowledge and practices compared to women in rural area, while the mean positive nutritional attitude of rural women was nearly as same as the mean attitude among urban women (31,32). Furthermore, the present study showed that the mean of knowledge, attitude and nutritional practice among women with history of abnormal delivery were more than those with normal delivery. This may be attributed to the fact that high rate of caesarean section with high mortality and morbidity rate were usually reported among pregnant women with poor level of knowledge and unhealthy dietary practices (33,34).

Moreover, the most significant predicting factors for knowledge in this study were high women education followed by working. Also, the most significant predictor for good nutritional practice was women's knowledge. This result supported by the fact that good knowledge about basic nutrients and adequate well balanced diet usually resulting in positive dietary practices which are important determinants of optimum health from conception until death (34-36).

Maternity and community health nurses must understand the function of the basic nutrients and metabolism. An understanding of the guidelines for the selection of an adequate diet is essential so that nurse can teach women about nutrients and be able to answer any questions related to diet. Furthermore, nurses should be able for assessing the women's educational needs in that respect and try to encourage the pregnant women to take proper and well balanced diet throughout different phases of life.

Conclusion and Recommendations

Based on the findings of the present study, It can be concluded that about half of pregnant women aged less than 25 years and their education level was high, while on the other hand only a little percentage were illiterate or just read and write. The majority of them were also housewives with poor socioeconomic standard. It was found that most of women had a very poor level of knowledge about nutrition during pregnancy. Where more than half of women in the present study lacked the basic and the essential knowledge regarding the importance, constituents and sources of most of the types of vitamins and minerals.

Moreover, unhealthy food practice was observed among them. The current study also showed that most of women had a poor level of knowledge and practices about calcium, zinc, iron and other basic nutrients. By other words they found to be failed to meet their high physiological requirements necessary for themselves and their growing fetus. Furthermore, the most significant predicting factors for knowledge in this study were high women education followed by working. Again, this study presented the inter-correlation between, women's knowledge, attitude and practices of nutrition during pregnancy and women general and obstetrical characteristics. So, it is obvious that good knowledge about basic nutrients and adequate well balanced diet usually resulting in positive dietary practices which are important determinants of optimum health from conception until death. In the view of these study findings, ***it is recommended to:***

1- Encourage pre-pregnancy counseling for future mothers and during early pregnancy about proper and balanced maternal nutrition.
2- Enforce good prenatal care nutritional counseling of supplementation of iron and folic acid.
3- Supplying the antenatal units and MCH centers with enough vitamins and minerals necessary for pregnant women and supplying them with adequate audiovisual materials that help nurses in health teaching.
4- Enforce in-service training programs to be carried out for nurses working antenatal units to enrich their knowledge regarding the importance of maternal nutrition during pregnancy.
5- Education and communication are needed to disseminate information about nutrition. Face to face communication between the health care providers and the expectant mother is crucial. The nurse as a nutritional counselor shows a concern and positive attitude towards the expectant mother, and seek to understand her nutritional needs and problems.
6- Continuing educational and staff development programs for maternity nurses to be able to determine nutritional problems during pregnancy and help women to assume their responsibilities during maternity cycles.

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5. References:

1- Royal Australian College of Obstetricians and Gynecologists, 2008. Vitamin and Mineral Supplementation in Pregnancy. [cited 2009, August 22], available from: http://www.ranzcog.edu.au/publications/statements/C-obs25.pdf.
2- National Institute for Health and Clinical Excellence, 2008. Improving the health and nutrition of pregnant and breastfeeding mothers and children in low-income households. [cited 2009, August 22], Available from: www.nice.org.uk/PH011.
3- Nagiebs. S., 2003. Nutrition during maternity cycle .Review article, University of Assiut, Faculty of Nursing. 18-22.
4- Academy for Educational Development, 2004. Maternal nutrition during pregnancy and lactation.. [cited 2010,

May 2]. Available from: http://www.pronutrition.org/files/MaternalNutritionDietaryGuide.pdf
5- Maynord KM. Westenbey L ,2003. Aboriginal teenage pregnancies compared with non-aboriginal in South Australia. J.Obstet. Gynecol,; 42(2) :187-92.
6- United Nations ACC Sub-Committee on Nutrition, 2000. 4th Report on the World Nutrition Situation: Nutrition throughout the lifecycle. [Accessed 2009, November 11]. Available from: http://collections.infocollections.org/ukedu/en/d/Jh1313e/.
7- Silva AM, Stephenson T. Symmonds ME, 2003. Maternal nutrition as a determinant of birth weight. Achieves of Disease in Childhood;86(1),4-6.
8- Jenson j., Smolin L., Mary B., 2003. Nutrition science & application, 3rd. Tokyo: Saunders Collage publishing; 35-63.
9 World Health Organization, 2006. Promoting Optimal Fetal Development: report of a technical consultation. [cited 2010, May 2]. Available from: http://www.who.int/nutrition/publications/fetal_dev_report_EN.pdf.
10-National Aboriginal and Torres Straight Islander Nutrition Working Party,2000. National Aboriginal and Torres Straight Islander Nutrition Strategy and Action Plan 2000-2010.. [cited 2009, August 15] Available from: http://www.nphp.gov.au/signal.
11- Williams DR. Eating for two good nutrition during pregnancy .File // A: e pregnancy. British Nutrition Foundation 31: 28–59.; 2003.
12 - Guyton, A. Hall, J. ,2006. Textbook of Medical Physiology. 11th ed. Elselvier Inc. Philadelphia.
13-Murray S., and Mckinney S., 2006. Foundation of Maternal –Newborn Nursing, 4th ed, ElsevierInc;167.
14- Perry P., Lowder milk D., 2006. Maternity Nursing, 7th ed, Mosby;221.
15- Diane M., Margerat A., 2009. Myles Midwives , 15th ed,China;258-260.
16- Scott S., and Kyle T., 2009. Maternity and Pediatric Nursing, Lippincott Williams and Wilkins, London; 207-212.
17- Springmever DW., 2004. A gopinion. htt:// www.file:// AGOP 911HTM.
18- Laura Riley. www.stroknet .com//:File: nutrition for you, nutrition for two. 2004.
19- Wu, G. Bazer, F. Cudd, T. et al. 2004. Maternal Nutrition and Fetal Development. J Nutrition; 134: 2169-72.
20- Mulhausler B. Adam, C. McMillan, C., 2008. Maternal nutrition and the programming of obesity. Organogenensis; 4(3): 144-52.
21- Food and Agriculture Organization of the United Nations Special program for food security, 2004. Rationale Objectives and Approach. htt://www.fao.org.
22- Jane N., and Nancy T., 2010. Introductory Maternity & Pediatric Nursing, 2nd ed, Wolters kluwer / Lippincott Williams & wilkins;113.
23- Matin- Gronert, M. Ozanne S., 2006. Maternal nutrition during pregnancy and health of the offspring. Information Processing and Molecular Signalling; 34(5): 779-82.
24- National Health and Medical Research Council, 2003. Dietary guidelines for Australian Adults. [cited 2010, January 20]. Available from: http://www.nhmrc.gov.au/publications/synopses/dietsyn.htm.
25- Gibson RS., Holth AL., Ferguson EL., 2003. Risk of suboptimal iron and zinc nutritive among adolescent girls in Australia and Newzealand: Causes , consequences and solutions. Asia Pac J Clin Nutrition; 11suppl, 3: 9543-52.
26-Jean T. Cox, Sharon T. Phelan, 2008. Nutrition During Pregnancy Obstetrics and Gynecology Clinics of North America,; Vol 35 (3): 369-383.
27- Tanya Jolliffe. 2012. Healthy Eating Expert. The Importance of Eating Enough During Pregnancy Terms and Conditions and Privacy Policy update on February 8,.www.Babyfit.com.
28- Lynna Y., and Jon C., 2005. Maternity Nursing Care, USA, Canada, 306-309.
29- Rochester, MN. , 2009. Pregnancy Weight GainWhat is Healthy?..: Mayo Clinic,. (Accessed October 27, 2009 at http://www.mayoclinic.com/health/pregnancy-weight-gain/PR00111.)
30- Blount, Darynee, 2006. American pregnancy association, Promoting pregnancy wellness.Nutrition for Pregnant Women. Retrieved July, from http://scc.uchicago.edu/nutritionpregant.htm.
31- Neeson N., Stanhope M., Lancaster J, 2002. Foundations of community health nursing, community oriented practice .2nd.London: Mosby company;355-63.
32- Kosterich J. Importance of Healthy Eating Before and During Pregnancy. www. Virtual medicl center.com © 2002 - 2012 | Privacy Policy Last updated 29 Apr 2012.
33- The Importance of Proper Nutrition During Pregnancy, 2012. Posted by admin on February 27, Lower Back Pain Relief Powered by Word Press Theme zBench Valid XHTML and CSS3.
34- Pregnancy Nutrition, 2009. Foods To Avoid During Pregnancy. Rochester, MN.: Mayo Clinic,. (Accessed October 27, 2009 at http://www.mayoclinic.com/health/pregnancy-nutrition/PR00109/METHOD=print.)
35- Pregnancy Nutrition. Irving, TX.: American Pregnancy Association, 2009. (Accessed October 27, 2009 at http://www.americanpregnancy.org/pregnancyhealth/pregnancynutrition.html.)
36- Painter J., Rah J., Lee Y., 2003. Comparison of international food guide pictorial representation .Journal of the American Dietetic Association;102(4): 483- 489.

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