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Effect of Nursing Intervention on the Beliefs and Practices of Pregnant Women Regarding Vitamins and Minerals Intake

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Abstract: **Pregnancy represents a time of rapid change in maternal physiology and nutritional requirements. Dietary recommendations during pregnancyshould have a particular focus on micronutrients (vitamins, minerals) to support growth and development of the fetus .The aim of the current study was to assess the effect of nursing intervention on the beliefs and practices of pregnant women regarding vitamins and minerals intake. The Design of this study was quasi-experimental. The target population comprised all pregnant women who have files for follow up at MCH center. Sample size was 100 pregnant women fulfilling the inclusion criteria. Tools of this study included sociodemographic data, questionnaire about beliefs and practices of pregnant women regarding vitamins & minerals intake and a schedule of 24-hour recall dietary assessment for pregnant women. The results revealed thatthere were a statistically significant difference between vitamins and minerals intake during pregnancy and pregnancy outcomes after nursing interventions. It is concluded that the nursing interventions, improved beliefs of pregnant women and corrected practices toward vitamins and minerals intake. It is recommended thatfurther research on wider scale are needed to explore beliefs and practices, increase awareness about vitamins and minerals intake during pregnancy and study their effect on pregnancy outcomes.**

Keywords: **pregnancy, beliefs, practices, vitamins and minerals.**

I. INTRODUCTION

Pregnancy and birth can be very special time in the life of a woman. The nine months of pregnancy, as well as labor and delivery, are filled with many physical and psychological changes, as well as changes in lifestyle **(Goh, Bollano, Einarson and Koren, 2013)**. The importance of health care throughout pregnancy is emphasized, because proper health care increases the likelihood of a healthy pregnancy and a healthy baby **(Rooney, 2010).**

Nutrition of the fetus begins at conception. For this reason, the nutrition of the mother is important before conception (probably several months before) as well as throughout pregnancy and breast feeding **(Christian, 2010)**. An ever-increasing number of studies have shown that the nutrition of the mother will have an effect on the child, up to and including the risk for cancer, cardiovascular disease, hypertension and diabetes throughout life **(Balluz, Kieszak, Philen and Mulinare, 2009)**.

Briggs et al., (2011) hypothesized that a healthy diet during pregnancy is essential to provide all the nutrients needed by a mother and her growing baby. They added that it is a common misconception that pregnant women need to "eat for two". In fact, most of the additional nutrients needed during pregnancy can be obtained by selecting appropriate foods and eating a high quality nutrient-dense diet **(Murkoff and Heidi, 2010)**.

Pregnant woman requires extra amounts of nearly all essential nutrients in addition to protein, fats, carbohydrates and fiber to support the growth and development of the fetus (**Godfrey and Barker, 2007)**

Prenatal vitamins are vitamin and mineral supplements intended to be taken before, during pregnancy and during postnatallactation**(Mocket al., 2011)**. Although many of our required vitamins, minerals, amino acids, essential fatty acids, and other constituents are found in food, the physiologic demands of the woman during preconception and pregnancy may require additional dietary supplementation. Requirements for folic acid, calcium, iron, zinc, vitamin D, vitamin C, and vitamin B increase substantially during pregnancy **(De-Regil, Fernandez,Dowswell and Pena-Rosas, 2010)**.

Studies show that nutritional knowledge affects the quality of food intake and also healthy choices of purchased food **(Verbeke, 2008)**. Advancement of individual nutrition knowledge (NK) provides new information which may stimulate changing of attitude and subsequently result in enhancement of dietary practices **(De Vriendt, Matthys, Verbeke, Pynaert and De Henauw, 2009)**. The adequate implementation of adequate maternal nutrition will contribute to maternal health improvement, support the reduction of maternal morbidity and mortality, and improve knowledge and healthy skills for provision of maternal and child nutritional services at health facility level**(Haider,Olofin and Wang, 2013).**

SIGNIFICANCE OF THE STUDY:

Pregnancy and childbirth are important stages in life, accompanied by a 50% increase in maternal blood volume to produce the additional blood needed to support the growth of the fetus. This period not only requires more energy, but also more vitamins and minerals **(Correa, Botto, Liu, Mulinare and Erickson, 2009).**

Micronutrient deficiencies are worldwide problems. Studies in the Arab countries indicate that these deficiencies are widely prevalent, although, their prevalence varies in numerously from country to country, and from disease to disease **(Lozoff, Jimenez, Hagen, Mollen and Wolf, 2012).** The major micronutrient deficiencies reported in this part of the world are iron deficiency anemia, iodine deficiency disorders, and vitamin A and D deficiencies **(Angulo et al., 2012).** Iron deficiency anemia is a common nutritional problem in all Arab countries. Its prevalence ranges from 10% to 80% depending on age, sex and physiological status of the population**(Pitkin, 2011).** Iodine deficiency disorders are reported in many remote and mountain areas in this region **(Zimmermann, 2009)**. Studies on vitamin D deficiency are scarce. However, several studies from Saudi Arabia showed that even with the abundant sunlight in the country, the prevalence of vitamin D deficiency is relatively high**(Bhutta, 2009)**.

The main nutritional problem in Egypt is iron deficiency anemia. It is estimated about 30%-70% of pregnant women suffered from iron deficiency anemia **(El-ZanatyandWay, 2009).** Iodine deficiency disorders are less compared to iron deficiency anemia. The prevalence ranged from 6% to 80%. Iodine deficiency disorders were also reported in some mountain areas in Saudi Arabia and United Arab Emirates, but these disorders are not common health problems **(Hassan, Abdel Galil and Moussa, 2010**). Few studies were carried out on vitamin A deficiency; however it is a problem of concern in Egypt. Unsound food habits, low intake of foods rich in vitamin A and infection (such as measles) are the main causes of vitamin A deficiency**(Moussa, Shaheen, El–Nehry and Abdel Galil, 2010).**

Unfortunately, most of pregnant women are unaware about importance of taking vitamins and minerals during pregnancy and the decreased intake has a bad effect on mother and her fetus. Furthermore, given the importance of beliefs, practice, and given the existence of limited Egyptian studiesabout nutritional knowledge of pregnant women and their dietary behaviors, so the investigator found that there is a need for providing educational nursing intervention for women of childbearing age regarding the intake of vitamins and minerals. Such a study would benefit pregnant women as regards information and skills movided and consequently would benefit the fetus. The results will be applied in the wrong practices and potentially provide evidence that supports nursing practices and polices.

AIM OF THE STUDY:

The current study aims to:-

Assess the effect of nursing intervention on the beliefs and practices of pregnant women regarding vitamins and minerals intake.

RESEARCH HYPOTHESES:

- Beliefs of pregnant women who attend the nursing intervention will be better than those who did not attend the intervention.

- Practices of pregnant women who attend the nursing intervention will be better than those who did not attend the intervention.

II. SUBJECTS &METHODS

Research Design:

A quasi- experimental study design (non-equivalent control group design) was used to carry out the present study.

Setting:

The present study was conducted at the Maternal and Child Health Center in Qebly at Shebin El-Koom, Menoufia Governorate. This center was selected because of the high flow rate of pregnant women.

Sample:

The target population of this study was pregnant women who attended at the Maternal and Child health Center in Qebly.A sample of 100 pregnant women constituted the subjects of the study. They were divided equally into control and study group. Each is 50 women.

The inclusion criteria were as follows:

- Pregnant women both primipara and multipara.
- Normal pregnancy with no complications.
- Free form any medical or obstetric complications.
- Pregnant women at the gestational age of (13 to 40 weeks) to be free from minor discomforts of nausea and vomiting in the first trimester.

Sample size:

The sample sizing assumes that this intervention is effective in assessing beliefs and practices of pregnant women regarding vitamins and minerals intake based on past review of literature **(Chmurzynska, 2012)** has been calculated using the following equation: $n = (z2 \times p \times q)/D2$ at power 80% and CI 80%.The sample size was conducted to be **100** pregnant women who have files for follow up at MCH center.

Data Collection Tools:

Data were collected using four tools were developed by the researcher.

I. Interviewing Questionnaire:

This tool was devoted to select the eligible women who fulfill the proposed inclusion criteria. The tool consisted of the following parts:

Part 1:sociodemographic and physical characteristics: as name, age, telephone number, Body Mass Index **(Based on the classification of Body Mass Index by WHO, 2012)**, residence, education, and occupation.

Part 2: Family history: as hypertension, diabetes, heart disease, and allergy.

Part 3: Medical and surgical history: as chronic disease, medication intake, and any previous surgery.

Part 4: Previous Obstetric history: as gravidity,parity, abortion, still birth, number of preterm babies, and mode of delivery in previous pregnancies.

Part 5: Data about present pregnancy: as gestational age, length of baby, weight of baby, amount of amniotic fluid, and presence of any congenital anomalies.

II. Interviewing Questionnaire on Beliefs of Pregnant Women regarding Vitamins and Minerals Intake:

This tool tested beliefs of pregnant women regarding vitamins & minerals intake. The tool consisted of the following parts:

Part 1: General beliefs about vitamins and minerals supplements as difference between vitamins and minerals,vitamins and minerals supplements taken during pregnancy.

Part 2: Sources of vitamins and minerals supplements.

Part 3: Reasons for using vitamins and minerals supplements.

Part 4: Benefits of vitamins and minerals during pregnancy.

Part 5: Harmful effects of vitamins and minerals supplements.

Part 6: Food sources, body needs and daily requirements of the following vitamins: A, B, C, D, E, K, and Folic acid.

Part 7: Food sources, body needs and daily requirements of the following minerals: calcium, iron, iodine, zinc and sodium.

Part 8: The best time to start each type of vitamins and mierals supplement.

This tool is used as a pre / post test for beliefs.

Each part of the tool was scored separately according to the number of correct answers. The total score was calculated using the summation of all parts.

III: Interviewing Questionnaire on Practices of Pregnant Women regarding Vitamins and Minerals Intake:

This tool was developed with the aim of assessing practices of pregnant women regarding vitamins and minerals Intake. The tool consisted of the following parts:

Part 1: practices of taking vitamins and minerals supplements.

Part 2: Recommendation of taking vitamins and minerals supplements.

Part 3: Practices toward any side-effect suspected from dietary supplements.

Part 4: Practices if she can't swallow more than one pill of dietary supplements.

Part 5: Practices ofremembering time of dietary supplements every day.

This tool is used as a pre / post test for practices beliefs.

Each part of the tool was scored separately according to the number of correct answers. The total score was calculated using the summation of all parts.

IV: A Schedule of 24-hour Recall Dietary Assessment for Pregnant Women:

This tool was concerned with assessing the consumed diet by pregnant women in the 24-hour prior to the interview.

The tool consisted of the following parts:

Part 1: Name, age, and duration of pregnancy

Part 2: Type, quantity, and method of cooking breakfastfood

Part 3: Type, quantity, and method of cooking Lunch food

Part 4: Type, quantity, and method of cooking Dinner food

Part 5: Type, and quantity of snacks

Each part of the tool was scored by asking the pregnant woman about the amount of food she had taken by unit. The amount of food units was converted to grams by using the food exchange list (Appendix V). From the different kinds of

food, the researcher calculated the amount of vitamins (A, B, C, D, E, K and folic acid) and minerals (calcium, iron, iodine, zinc, sodium) for 3 days of the week. The results of the three days were sent for statistical analysis to determine the average of vitamins and minerals intake.

Validity of the Tools:

The validity of the tools was ascertained by a group of subject area experts who reviewed the tools for content and internal validity. They were also asked to judge the items for appropriateness, completeness and clarity (2 experts from the Faculty of Home Economics Nutrition Department, 2 experts from the Faculty of Nursing, and 1 expert from the Faculty of Medicine). Suggestions were incorporated into the tools.

Reliability of the Tools:

Test – retest reliability was applied by the researcher for testing the internal consistency of the tool. It was done through the administration of the same tools to the same participants under similar conditions on two or more occasions. Scores from repeated testing were compared.

Pilot Study:

Pilot study was conducted to test the applicability of the tools, the feasibility of the study and to estimate the time needed for data collection. It was conducted on 10% of the total sample (10 pregnant women). On the basis of the pilot study results; the researcher rephrased some questions. Hence, the pregnant women who shared in pilot study were not included in the study sample.

Procedure:-

The current study was carried out in three consecutive phases, namely preparatory, implementation and evaluation phases.

1. The Preparatory Phase:

An extensive literature review related to the study area was done including electronic dissertations, available books, articles, doctoral dissertation, research and peer interaction, ideas from external sources and periodicals. A review of literature to formulate knowledge base relevant to the study area was also done. An official permission was granted from the Maternal and Child health Center authorities.

The researcher's plan articulates procedures for describing the aim of the study to participants, the actual collection of data and recording information. A guide booklet and pamphlets (1- importance of nutrition and daily body needs of pregnant women, 2- Important vitamins for pregnant women, 3- Important minerals and daily nutrition model) were prepared by the researcher, reviewed by a jury.

2. The Implementation Phase:

The researcher applied the implementation phase according to the following steps:

The 1st step: Subjects (100 pregnant women) were divided into two groups (50study and 50control group). The researcher introduced herself to them, provided verbal explanation of the study and answered all related questions. They were interviewed to complete the sociodemographic data. Telephone numbers were taken to facilitate communication and follow up, then they are given pre-test questionnaires.

The 2nd step: The researcher started to give health education sessions according to subjects needs derived from pre –test and used guide booklet and pamphlets to facilitate explanation and to be a reference for them.

The nursing intervention included 3 main sessions as follows:-

1- Importance of nutrition and daily body needs of pregnant women

2 - Importance of vitamins and minerals during pregnancy

3- Beliefs and practices of pregnant women regarding vitamins and minerals intake.

The pregnant women were divided into 3 groups, 15-17 women. Each group received the 3 sessions.

Teaching Methods:

- Lecture (Simple Arabic)
- Group discussion

Teaching Aids:

- Data show presentation, guiding booklet and pamphlet.

Session 1:

Time: 30 - 40 minutes.

Session Objectives:

- Toillustrate the importance of good nutrition especially vitamins and minerals intake during pregnancy.
- To clarify daily body needs from different kinds of foods (dairy products, starches, fruit, vegetables, protein, fats, sweets, and fluids).

Session Outlines:

- Definition of pregnancy
- Signs & symptoms of pregnancy
- Importance of good nutrition especially vitamins and minerals intake
- The daily needs of different kinds of foods

Session 2:

Time: 40 - 45 minutes.

Session Objectives:

- To differentiate between vitamins and minerals.
- To illustrate the importance of vitamins during pregnancy (functions ,sources, and daily requirements)
- To illustrate the importance of minerals during pregnancy (functions ,sources, and daily requirements)

Session Outlines:

- Definition of vitamins and minerals
- Importance of vitamins and minerals supplements intake
- Functions, sources, and daily requirements of vitamins (A,B,C,D,E,K and folic acid)
- Functions ,sources, and daily requirements of minerals (calcium, iron, iodine, zinc and sodium)

Session 3:

Time: 30 - 35 minutes.

Session Objectives:

- To improve participants' beliefs about vitamins and minerals intake.
- To correct participants practices regarding vitamins and minerals intake during pregnancy.
- To teach pregnant women the daily nutrition model

Session Outlines:

- Practices of vitamins and minerals supplements intake
- Daily nutrition model to guide pregnant woman nutrition

After the end of 3 sessions the researcher gave the subjects summary about all 3 sessions

3. The Evaluation Phase:

The evaluation of the educational intervention effectiveness was ensured at the end of pregnancy. The women are given the post-tests (tool II &III).

Data Collection:

The data collection started in September 2014 till February, 2015.

September: screening phase and pre test.

From October to January: teaching sessions.

February: post-test.

Ethical Considerations:

Permission from Maternal and Child health Center key person was obtained before starting data collection.

Approaches to ensure ethics were considered in the studyregarding confidentiality and the informed consent. Confidentiality was achieved by the use of locked sheets with the names of the participating pregnant women replaced by numbers. All pregnant women were informed that the information they provided during the study would be kept confidential and used only for statistical purpose after finishing the study, the findings would be presented as a group data with no personal participant's information remained.

After explanations prior to enrollment in the study, informed consent was obtained verbally from all pregnant women. Each woman was informed that participation in the study was voluntary, and that she could withdraw from the study whenever she decided to and each one was given the opportunity to freely refuse participation. They were free to ask any question about the study details.

Statistical Design:

Upon completion of data collection, each pre/post test was coded and scored. The researcher coded the data into a coding sheet so that data could be prepared for computer use. Data was statistically analyzed using statistical package for social science (SPSS. IBM, USA, 2012) version 20 on IBM compatible computer. Test of significance was used to evaluate the program effectiveness in improving beliefs and practices. Level of significance was at $p< 0.05$ **(Fisher et al., 2008).**

Data were summarized using the following:

Two types of statistics were done:

- Descriptive statistics [e.g. percentage (%), mean (x) and standard deviation (SD)].
- Analytic statistics: which include the following tests?

1) **Chi-square test (χ^2):** was used to study association between two qualitative variables **.**

2) **Fisher's Exact test:** a statistical significance test used in the analysis of 2x2 contingency tables when at least 25% of cells has expected number < 5

3) **T- test:** is a test of significance used for comparison between two groups normally distributed having quantitative variables**.**

4) **Paired t-test:** measures whether means from a within-subjects test group vary over 2 test conditions of normally distributed data. The paired t-test is commonly used to compare a sample group's scores before and after an intervention .

Significance of Results:

For all the statistical tests done, the threshold of significance is fixed at the 5% level (P value), as follows:

Non – significant difference if	$P > 0.05$
Significant difference if	$P < 0.05$
Highly significant difference if	$P < 0.001$

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III. RESULTS

Table (1): Distribution of the Study Subjects Regarding Their Sociodemographic Characteristics.

Variable	The studied groups				X^2	P value
	Study N = 50		Control N = 50			
	No	%	No	%		
Mean Age	27±9					
Residence						
Rural	47	94	43	86	1.78	0.18
Urban	3	6	7	14		
Education						
Illiterate	8	16	6	12		
Secondary	28	56	27	54	0.59	0.74
University	14	28	17	34		
Occupation					FE	
Employee	5	10	3	6	0.54	0.72
House wife	45	90	47	94		

Table (1) shows the distribution of the study subjects regarding their sociodemographic characteristics. The mean age of the sample is 27±9 for the study and control group. Nearly most of the sample is rural residents. Around half of the two groups completed secondary education. The majority of the study participants of the two groups are house wives.

Table (2): Nutritional Assessment of Vitamins Intake (A, B, C, D, E, K, and folic acid) Pre and Post Intervention

Variable	Pre intervention				Post intervention				X^2	P value
	Study N = 50		Control N = 50		Study N = 50		Control N = 50			
	No	%	No	%	No	%	No	%		
Nutritional assessment of V. A										
350 – 450 mcg	10	20	8	16	0	0	5	10	0.27	0.87
450 – 550 mcg	16	32	17	34	0	0	18	36	69.4	<0.001
550 – 650 mcg	23	46	23	46	5	10	25	50		
650 – 750 mcg	1	2	1	2	26	52	2	4		
> 750 mcg	0	0	1	2	19	38	1	2		
Nutritional assessment of B.Vits										
15 – 25 mg	6	12	5	10	0	0	4	8	0.18	0.91
25 – 45 mg	23	46	22	44	0	0	21	42	72.1	<0.001
45 – 65 mg	19	38	22	44	3	10	20	40		
65 – 85 mg	1	2	1	2	5	14	3	6		
85 – 100 mg	1	2	0	0	27	54	2	4		
> 100 mg	0	0	0	0	15	30	0	0		
Nutritional assessment of V.C										
25 – 35 mg	1	2	1	2	0	0	1	2	0.33	0.95
35 – 45 mg	18	36	20	40	0	0	22	44	86.3	<0.001
45 – 55 mg	19	38	21	42	0	0	19	38		
55 – 65 mg	8	16	5	10	2	4	5	10		
65 – 75 mg	2	4	1	2	6	18	1	2		
75 – 85 mg	2	4	1	2	25	50	1	2		
> 85 mg	0	0	1	2	17	34	1	2		
Nutritional assessment of V.D										
< 5 mcg	5	10	6	12	0	0	10	20	1.20	0.75
5 – 10 mcg	19	38	17	34	0	0	19	38	56.1	<0.001
10 – 15 mcg	26	52	26	52	16	32	20	40		
> 15 mcg	0	0	1	2	34	68	1	2		

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Continued Table (2): Nutritional Assessment of Vitamins Intake (A, B, C, D, E, K, and folic acid) Pre and Post Intervention

Variable	Pre intervention				Post intervention				X^2	P value
	Study N = 50		Control N = 50		Study N = 50		Control N = 50			
	No	%	No	%	No	%	No	%		
Nutritional assessment of V.E										
< 5mg	7	14	4	8	0	0	8	16	3.6	0.31
5 – 10 mg	20	40	26	52	6	12	33	66	33.2	<0.001
10 – 15 mg	21	42	20	40	34	68	5	10		
> 15 mg	2	4	0	0	10	20	4	8		
Nutritional assessment of V.K										
< 30 mcg	7	14	7	14	0	0	5	10	0.05	0.98
30 – 50 mcg	25	50	24	48	0	0	24	48	65.3	<0.001
50 – 70 mcg	18	36	19	38	8	16	19	38		
70 – 90 mcg	0	0	0	0	26	52	1	2		
> 90 mcg	0	0	0	0	16	32	1	2		
Nutritional assessment of folic										
2 – 3 mg	6	12	5	10	0	0	5	10	0.87	0.65
3 – 4 mg	40	80	43	86	1	6	43	86	81.4	<0.001
4 – 5 mg	4	8	2	4	17	44	2	4		
> 5 mg	0	0	0	0	32	64	0	0		

Table (2) shows the distribution of the study subjects regarding nutritional assessment of vitamins intake (A, B, C, D, E, K, and folic acid) pre and post intervention. There is a highly statistically significant difference (P < 0.001) reveals atthe post test between study and control group regarding nutritional assessment of vitamins intake (A, B, C, D, E, K, and folic acid) .The main results are as follows: dietary intake of vitamin A in between (650 – 750 mcg) among study and control group is (52% & 4%) and the intake of (> 750 mcg) among study and control group is (38% & 2%) respectively. Dietary intake of vitamins B in between (85 – 100 mg) among study and control group is (54% & 4%) and the intake of (> 100 mg) among study and control group is about (30% & 0) respectively. Dietary intake of vitamin C in between (75 – 85 mg) among study and control group is (50% & 2%) and the intake of (> 85 mg**)** among study and control group is (34% &2%) respectively. Dietary intake of vitamin D of (> 15 mcg) among study and control group is (68% & 2%) respectively. Dietary intake of vitamin E in between (10 – 15 mg) among study and control group is (68% & 10%) respectively. Dietary intake of vitamin E in between (10 – 15 mg) among study and control group is (68% & 10%) respectively. Dietary intake of vitamin K in between (70 – 90 mcg) among study and control group is (52% & 2%) and the intake of (> 90 mcg) among study and control group is (32% &2%) respectively. Dietary intake of folic acid in between (4 – 5 mg) among study and control group is (44% & 4%) and the intake of (> 5 mg) among study and control group is (64% &0) respectively.

Table (3): Nutritional Assessment of Minerals intake (Calcium, Iron, Iodine, Zinc, and Sodium) Pre and Post Intervention

Variable	Pre intervention				Post intervention				X^2	P value
	Study N = 50		Control N = 50		Study N = 50		Control N = 50			
	No	%	No	%	No	%	No	%		
Nutritional assessment of calcium										
< 400 mg	4	8	2	4	0	0	2	4	2.10	0.56
400 – 600 mg	4	8	8	16	1	2	8	16	65.3	<0.001
600 – 800 mg	32	64	30	60	0	0	29	58		
800 – 1000 mg	10	20	10	20	7	14	10	20		
1000 – 1200 mg	0	0	0	0	35	70	1	2		
>1200 mg	0	0	0	0	7	14	0	0		
Nutritional assessment of iron										
< 10 mg	3	6	3	6	0	0	3	6	1.4	0.72
10 – 15 mg	27	54	27	54	0	0	24	48	96.4	<0.001
15 – 20 mg	19	38	19	38	0	0	19	38		
20 – 25 mg	1	2	1	2	5	10	1	2		
25 – 30 mg	0	0	0	0	36	72	2	4		
>30 mg	0	0	0	0	9	18	1	2		

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Nutritional assessment of iodine										
< 80 mcg	5	10	6	12	0	0	4	8	0.12	0.94
80 – 120 mcg	28	56	28	56	0	0	27	54	100	<0.001
120 – 160 mcg	17	34	16	32	0	0	17	34		
160 – 200 mcg	0	0	0	0	12	24	1	2		
200 – 220 mcg	0	0	0	0	35	70	1	2		
>220 mcg	0	0	0	0	3	6	0	0		
Nutritional assessment of zinc										
< 4 mg	6	12	5	10	0	0	4	8	0.21	0.90
4 – 6 mg	20	40	22	44	0	0	22	44	92.6	<0.001
6 – 8 mg	24	48	23	46	2	4	22	48		
8 – 10 mg	0	0	0	0	12	24	1	2		
10 – 12 mg	0	0	0	0	36	72	1	2		
Nutritional assessment of sodium										
<0.5 g	6	12	4	8	0	0	4	8	0.66	0.72
0.5 – 0.7 g	27	54	26	52	0	0	26	56	68.5	<0.001
0.7 – 1.0 g	17	34	19	38	12	24	18	36		
1 – 1.5 g	0	0	1	2	32	64	1	2		
>1.5 g	0	0	0	0	6	12	1	2		

Table (3) shows the distribution of the study subjects regarding nutritional assessment of minerals intake (calcium, iron, iodine, zinc, and sodium) pre and post intervention. There is a highly statistically significant difference (P < 0.001) reveals atthe post test between study and control group regarding nutritional assessment of minerals intake (calcium, iron, iodine, zinc, and sodium) .The main results are as follows: dietary intake of calcium in between (1000 – 1200 mg) among study and control group is (70% & 2%) respectively. Dietary intake of iron in between (25 – 30 mg) among study and control group is (72 % & 4%) respectively. Dietary intake of iodine in between (200 – 220 mcg) among study and control group is (70% & 2%) respectively. Dietary intake of zinc in between (10 – 12 mg) among study and control group is (72% & 2%) respectively. Dietary intake of sodium in between (1 – 1.5 g) among study and control group is (64% & 2%) respectively.

Table (4):Distribution of the Study Subjects Regarding General Beliefs about Vitamins and Minerals intake during Pregnancy

Variable	**Pre intervention assessment**				**Post intervention assessment**				**X^2**	**P value**
	Study N = 50		**Control N = 50**		**Study N=50**		**Control N = 50**			
	No	**%**	**No**	**%**	**No**	**%**	**No**	**%**		
Do you know difference between vitamins and minerals?										
Yes	6	12	8	16	50	100	10	20	78.6	<0.001[1]
No	44	88	42	84	0	0	40	80	0.27	0.6[2]
Do you know vitamins supplements during pregnancy?										
Yes	4	8	6	12	50	100	8	16	85.2	<0.001[1]
No	46	92	44	88	0	0	42	84	0.33	0.56[2]
Which vitamins?	N=4		N=6		N=50		N=8			
Vit B	1	25	2	33.3	2	4	2	25	3.74	0.44[1]
Vit C	0	0	1	16.7	1	2	1	12.5	0.93	0.92[2]
Vit. D	0	0	0	0	1	2	0	0		
Folic acid	0	0	1	16.7	8	16	1	12.5		
All of the above	3	75	2	33.3	38	72	4	50		
Do you know minerals supplements during pregnancy?										
Yes	6	12	7	14	50	100	8	16	78.6	<0.001[1]
No	44	88	43	86	0	0	42	84	0.078	0.78[2]
Which minerals?	N=6		N=7		N=50		N=8			
Calcium	0	0	0	0	18	36	1	12.5		
Iron	0	0	1	14.3	17	34	2	25	16.8	<0.001[1]
Both	6	100	6	85.7	10	20	4	75	2.68	0.44[2]
None	0	0	0	0	5	10	1	12.5		

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Table (4) shows the distribution of the study subjects regarding general beliefs about vitamins and minerals intake during pregnancy. There is a highly statistically significant differences (p<0.001) reveals atthe post test between study and control group. The mean results are as follows: regarding beliefs about difference between vitamins and minerals (100% study group &20% control group), regarding beliefs about vitamins supplements during pregnancy (100% study group &16% control group), and regarding beliefs about minerals supplements during pregnancy (100%study group&16% control group) respectively.

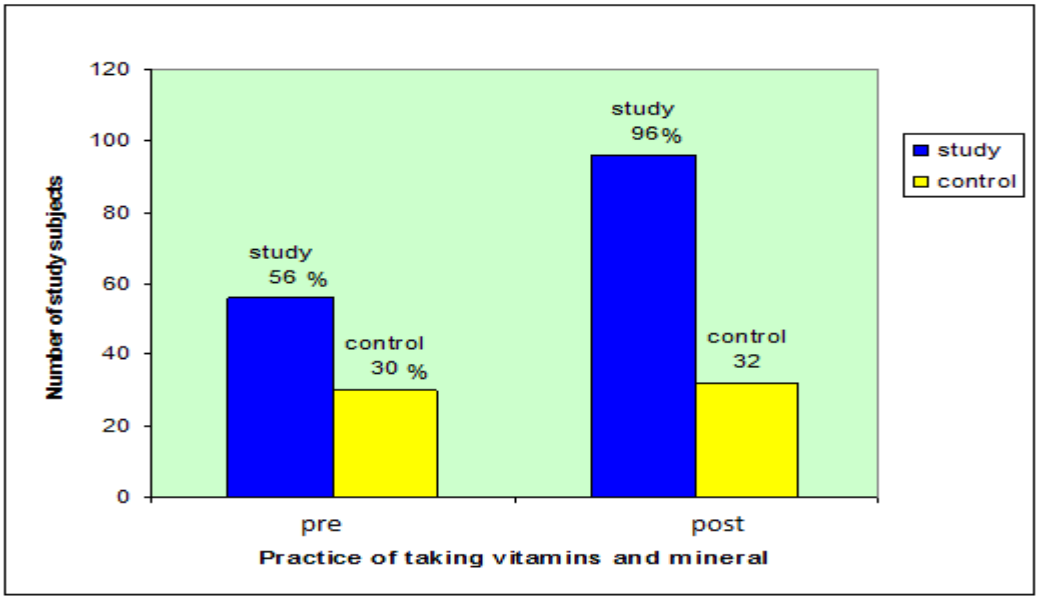

Figure (1): Distribution of the Study Subjects Regarding Practices about Vitamins and Minerals Intake.

Figure (1) shows distribution of the study subjects regarding practices about vitamins and minerals intake. There is a highly statistically significant differences (p<0.001) reveals atthe post test between study and control group regarding practices about vitamins and minerals intake. The main results are as follows: Practices of vitamins and minerals intake among study and control group are (96%&32%) respectively.

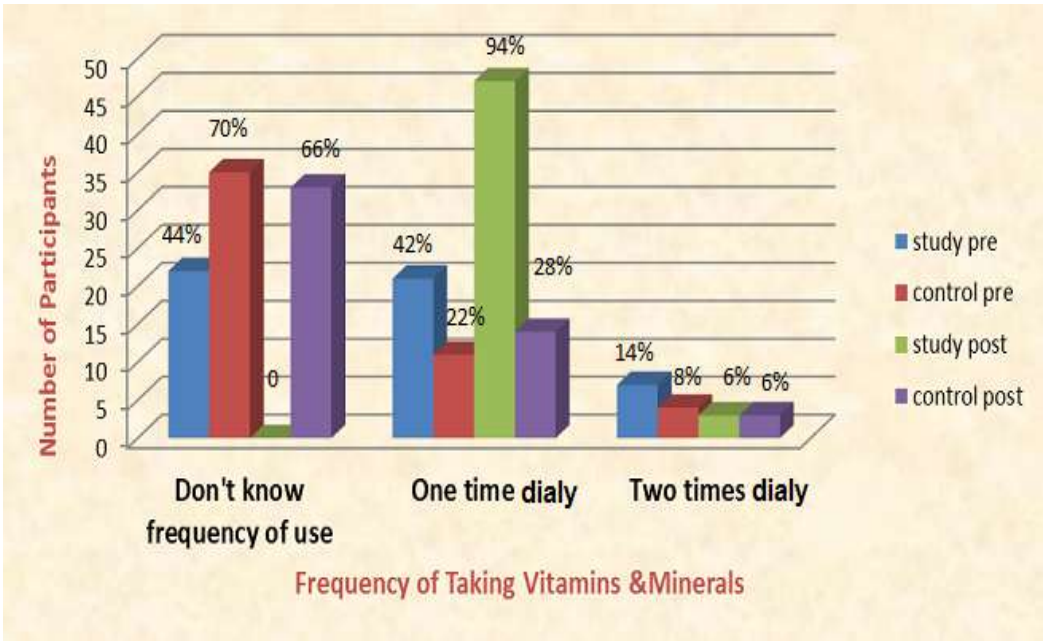

Figure (2): Distribution of the Study Subjects Regarding Practices about frequency of Vitamins and Minerals Intake.

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Figure (2) shows distribution of the study subjects regarding practices about frequency of vitamins and minerals intake . There is a highly statistically significant differences (p<0.001) reveals atthe post test between study and control group regarding practices about frequency of vitamins and minerals intake. The main results are as follows: practices about frequency of vitamins and minerals intake among study and control group one time daily are (94% & 28%) respectively.

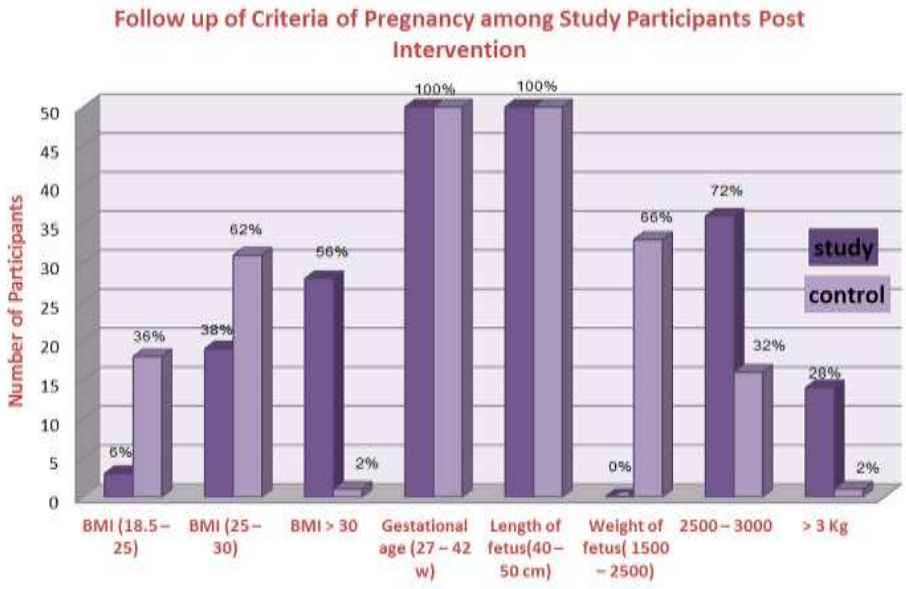

Figure (3): Distribution of the Study Subjects Regarding Criteria of Pregnancy Post Intervention.

Figure (3) shows the distribution of the study subjects regarding criteria of pregnancy post intervention. There is a highly statistically significant differences (p<0.001) reveals at the post test between study and control group regarding criteria of pregnancy post intervention. According to classification of Body Mass Index nutritional intake of the study group (56%) is better than the control group (2%).Weight of fetus in between (2500-3000 kg) for the study and control group is (72% &32%) respectively.

VI. DISCUSSION

The concept of value of vitamins and minerals in pregnancy could cause an increase intake of supplements containing them **(Emamghorashi andHeidari ,2010)**.This demonstrates the necessity for proper nursing intervention for women of childbearing age regarding the safety of vitamins and minerals as well as other medicines intake **(Ronsmans, Fisher, Osmond, Margetts and Fall, 2009).** Hence the lies the interest of the current study

The present study aims to assess the effect of nursing intervention on the beliefs and practices of pregnant women regarding vitamins and minerals intake.

The participants of the present study mean age was twenty seven years. The researcher selected this age group as this agreed with **Dietzet al., (2006)** who conducted a study in Romania in which the mean age of study participants was twenty seven and a half years, more than half of study participants were between 19 and 35 years, and lower percent were over 35 years. The researcher selected the pervious criteria as the Levelof nutritional knowledge has a strong independent association with the use of supplements during pregnancy depended mainly on age (**Foote et al., 2009)**.

The majority of the study participants were rural residents with low socioeconomic status which may negatively affect vitamins and minerals intake. This is supported by a study conducted in America by **Schollet al.,(2008)** who mentioned that significant populations of women at reproductive age do not satisfy requirements for micro-elements and vitamins. This concern in particular women who are pregnant, or at low socioeconomic level. Previous results reported by**Bodnar and Siega-Riz ,(2008)**in the United States, estimated that among pregnant women in the USA who are at low socioeconomic level, as much as one third consumed insufficient amounts of folic acid, one third consumed calcium and around half of study participants consumed iron and zinc. Also the result is supported by**Ogundipe et al.,(2012)** who reported that a demographic factors that persisted on being associated with the use of multivitamins during pregnancy was

area of residence as making health-related decisions, as in country, women in the urban area are usually having a better financial status.

The majority of the study participants were secondary educated which may affect vitamins and minerals intake. A study conducted in Poland by **Chalcarz, Merkiel and Marzecka,(2012)** concluded that higher level of education was associated with vitamin/mineral supplementation use. Previous studies conducted in Finland **(Arkkola et al.,2006)**, and Tanzania **(Nicholson et al.,2006)** reported that more frequent use of supplements during pregnancy was found to be associated with a higher socio-economic status, higher level of education and use of prenatal medical services.On the hand, another study conducted in Romania by**Lunet ,Rodrigues, Correia& Barros,(2008)**who reported that it was not clear whether there is a relationship between socio-demographic factors or the level of education and the use of iron, folic acid and multivitamins in pregnancy.

In the current study the majority of the study group was aware of vitamins and minerals to be taken during pregnancy after nursing intervention. These results were supported by several studies: A study conducted in Romaniaon a sample of 400 pregnant women by **Pena, Viteri and Mahomed, (2010)** who reported thatmore than half the participants used folic acid or iron during their pregnancy, while approximately two thirds took multivitamin supplements.Nutritional beliefs after nursing education were significantly associated with the intake of these supplements, regardless of the frequency of prenatal visits or socio-demographic characteristics.

The results of the current study reported that the majority of study group were taking vitamins and minerals as ordered after nursing intervention. These results were supported by a study conducted in Iran by**Dallongeville,Marécaux, Cottel, Bingham and Amouyel,(2010**) who reported that more than two thirds of study participants complied with the supplementations. In contrast theresult of the present study is higher than thatreported by **Beall, Wijngaard, Gemert and Ross, (2007)** who reported that about one quarter ofstudy participantscomplied with the supplementsprescribed in Perak, northern Malaysia.

Regarding the frequency of use, the results of the current study revealed that before the intervention the majority of study participants were unaware of the frequency of intake after the nursing intervention; the study group became aware of taking vitamins and minerals once daily. Nearly similar results were also reported in a study conducted by **Kim et al., (2009)**where two thirds took one supplement daily. This is a particularly important finding as excessive use or over-dosing of vitamins can lead to adverse effects.

Based on the current findings; the study hypotheses are all accepted. In this study, the researcher found that nursing intervention improved subject's beliefs and corrected practices of vitamins and minerals intake among pregnant women.

V. CONCLUSIONS

Based on the findings of the current study that assessed the effect of nursing educational intervention on beliefs and practices of pregnant women regarding vitamins and minerals intake, it is concluded that:

- The majority of the study sample ate an unbalanced diet, not within the recommended guidelines before the nursing intervention.
- There wasinsufficient knowledge of pregnant women about proper nutrition during pregnancy regarding vitamins and minerals intake before the nursing intervention.
- Beliefs of pregnant women who attended the nursing intervention were better than those who did not attend the intervention.
- Practices of pregnant women who attended the nursing intervention were better those who did not attend the intervention.
- Supplementing vitamins and minerals components during pregnancy is necessary which affects on pregnancy outcomes.
- Education is essential for mothers to improve their nutritional knowledge about vitamins and minerals intake to be able to perform healthier practices of dietary intakes.

VI. RECOMMENDATIONS

- Awareness about the use of vitamins and minerals supplements during pregnancy should be addressed through health professionals.
- Women at childbearing age must be educated about the necessity for proper nutrition regarding vitamins and minerals intake before and during pregnancy.
- Data on vitamins and minerals supplements use among pregnant women should be presented separately during their routine antenatal check up at the Maternal and Child Health Center.
- Further studies on a more wide scale are needed to explore beliefs and practices, increase awareness about vitamins and minerals intake during pregnancy and assess their effect on pregnancy outcomes.

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