The Impact of Nutrition Education Program upon Pregnant Mothers' Nutritional Knowledge

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الخلاصة

الهدف: تحديد فاعلية البرنامج التثقيفي التغذوي على المعارف التغذوية للأمهات الحوامل.

المنهجية: دراسة شبه تجريبية استخدمت لتحديد فاعلية برنامج تثقيفي تغذوي على معارف الأمهات الحوامل التغذوية. شملت العينة الغرضية غير الاحتمالية((60) أم حامل اختيرت من مركز الرعاية الصحية الأولية/البياع في مدينة بغداد. قسمت العينة إلى مجموعتين متساويتين مجموعة الدراسة، والمجموعة الضابطة(. تم تطوير استمارة استبيان كأداة لجمع البيانات تتناسب مع الغرض من الدراسة. أجريت الدراسة الاجرائية والمتابعة للفترة من الأول من تشرين الأول 2006 ولغاية الأول من تموز 2007 وتم تحديد الثبات ومصداقية محتوى استمارة الاستبيان والمتابعة. تم تحليل البيانات باستخدام أسلوب تحليل البيانات الإحصائي الوصفي وأسلوب تحليل البيانات الإحصائي الاستنتاجي.

النتائج: أشارت النتائج إلى أن المشاركات في مجموعة الدراسة حصلن على فوائد من تنفيذ البرنامج التثقيفي التغذوي مع حدوث تغيير جوهري في معارفين التغذوية.

التوصيات: أوصت الدراسة بإمكانية تقديم البرنامج التثقيفي التغذوي لجميع الأمهات الحوامل اللواتي يراجعن مراكز الرعاية الصحية الأولية.

Abstract

Objective: Determine the effectiveness of the Nutrition Education Program upon the pregnant mothers' nutritional knowledge.

Methodology: ٨ quazi-experimental study was carried out to determine the effectiveness of the nutrition education program upon the pregnant mother's nutritional knowledge. A non-probability "purposive sample" of (60) pregnant mother was selected from Al-bayaa' Primary Health Care Center in Baghdad City. These mothers were divided into two equal groups; study group and control group. A questionnaire was developed as a tool of data collection for the purpose of the study. A pilot study and follow-up was carried out to test the reliability and validity of the questionnaire for the period of Octoberl"2006 to July 12007. Data were analyzed through the application of descriptive and inferential statistical data analysis approaches.

Results: The results of statistical data analysis revealed that the study group participants had benefits from the implementation of the nutrition education program and dramatic change had occurred in their nutritional knowledge.

Recommendations: The study recommended that the nutrition education program can be presented to all pregnant mothers who are attending to the Primary Health Care Centers.

Key Words: Nutrition, Pregnant Women, Nutritional Knowledge

Introduction

The influence of nutrition on the course of pregnancy and successful pregnancy outcomes include a viable infant of acceptable birth weight and infant free from congenital defects (1) Healthy eating behaviors during pregnancy enables optimal gestational weight gain and reduces complications, both of which are linked to positive birth outcomes and contribute to women's overall health. Poor maternal nutrition is linked to low infant birth weight (2).

Maternal nutritional status at conception influences how nutrients are partitioned between the mother and fetal dyad. Poor iron and folic acid linked to preterm births and fetal growth retardation. Supplementation with food and micronutrients during the inter pregnancy

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period may improve pregnancy outcomes and maternal health among women [3].

Iron deficiency is the most common nutritional disorder in the world. Iron deficiency anemia affect more than (3.5) billion people in the developing world. Iron deficiency anemia (IDA) is associated with significantly poor pregnancy outcome [4].

The definitive negative outcome of poor prenatal health and nutrition that is reflected in the high prevalence of maternal mortality in developing countries is (500/100000) live births, and the rate for developed countries is (10/100000) live births [5]. Healthy eating patterns and adequate intake such as folic acid and supplement nutrients provides women with benefits that go well to support future pregnancies [6].

Nutritional deficiencies in pregnancy is a global problem and is associated with increased maternal morbidity and mortality and more common in developing countries than in developed countries and is associated with increased maternal morbidity and mortality [7].

Methodology

A quasi-experimental design was carried out in the present study with the application of a pre-post tests approach for the study and control groups. Non-probability "purposive sample" of (60) healthy primi gravid women, aged between (1549) years was selected from Al-bayaa Primary Health Care Center. It was divided into two equal groups of (30) mothers for each group.

These groups were monitored at all trimesters of pregnancy. Such monitoring included the measurement of body mass index (BMI), laboratory tests like fasting blood sugar (FBS), hemoglobin (Hb), protein and sugar in urine by using strips which contain protein and glucose tests.

A questionnaire was constructed through literature review and the use of information which had emerged from the prior assessment. The questionnaire was used as a mean of data collection. It was comprised of three main parts:

Part 1: Demographic Information

This part presents the demographic data which is comprised from different items as the following:

1. Information about the pregnant mother's age, educational level, occupation, and socio economic status.
2. Laboratory tests for three trimesters and post pregnancy.

Part 2: Evaluation of Pregnant Mothers' Nutritional Knowledge

An instrument that was comprised of (124) item which were concerned with information of the pregnant mothers' nutritional knowledge.

Part 3: Other Specific Information: This part was concerned with food frequency intake.

Data were analyzed through the use of descriptive statistical data analysis approach (frequencies, percentage, mean of score, standard deviation, and inferential statistical data analysis approach (T-test).

Table 1. Distribution of the pregnant mothers' demographic characteristics

No.	Demographic Characteristics	Study group		Control group	
		F	%	F	%
1	Age (year)				
	17-21	15	50.0	14	46.7
	22- 26	10	33.3	11	36.6
	27 and >	5	16.7	5	16.7
2	Pregnant mother's educational level				
	Primary school graduate	7	23.3	8	26.7
	Intermediate school graduate	8	26.7	8	26.7
	High school graduate	6	20.0	6	20.0
	Institute graduate	4	13.3	3	10.0
	College graduate	5	16.7	5	16.7
4	Pregnant mother's occupation				
	Unemployed (including housewife).	20	66.7	25	83.3
	Government employee	10	33.3	5	16.7
6	Type of Family				
	Nuclear	6	20.0	3	10.0
	Extended	24	80.0	27	90.0
7	Socioeconomic status				
	Low	1	3.3	0	0.0
	Moderate	22	73.3	23	76.7
	High	7	23.3	7	23.3
8	Primary health care center visits				
	Regular	30	100.0	27	90.0
	Irregular	0	0.0	3	10.0
9	Type of delivery				
	Normal vaginal delivery	25	83.3	23	76.7
	Cesarean section	5	16.7	7	23.3

f= frequency, =٠/٥ percentage

This table revealed that most of the pregnant mothers for both groups was (17-21) years old, intermediate school graduates, housewives, coming out of extended families, having moderate socioeconomic status, attending the primary health care centers on regular basis, and having normal vaginal delivery.

Table 2. Comparison significant between the study and control groups relative to their food frequency intake

Food Groups	Study Group		Control Group		P-value
	Mean	SD	Mean	SD	
Fats	1.500	0.4591	1.547	0.4640	0.952
Meats	1.944	0.5942	2.044	0.7717	0.586
Sugars	1.722	0.7315	1.969	0.6758	0.236
Fruits	1.544	0.6966	1.608	0.6649	0.952
Vegetables	1.598	0.6201	1.758	0.6216	0.134
Legumes	1.205	0.7195	1.481	0.7240	0.586
Grains	1.404	0.4745	1.767	0.5383	0.035
Beverages	1.146	0.6712	1.363	0.4505	0.134
Miscellaneous	1.128	0.6107	1.544	0.7767	0.071

p value=probability level, SD= standard deviation

This table depicted that there were no significant differences between pregnant mother's as the study and control groups with respect to their food frequency intake except that of grains.

Table 3. Distribution of the pregnant mothers with regard to laboratory tests of hemoglobin (Hb), fasting blood sugar (FBS), glucose and protein in urine during and after pregnancy

No.	Laboratory Test	Study group		Control group	
		f	(%)	f	(%)
1.1	**First trimester Hb**				
	Non anemic	30	100.0	30	100.0
1.2	**Second trimester Hb**				
	Anemic	0	0.0	4	13.3
	Non anemic	30	100.0	26	86.7
1.3	**Third trimester Hb**				
	Anemic	0	0.0	6	20.0
	Non anemic	30	100.0	24	80.0
1.4	**Post delivery Hb**				
	Anemic	3	10.0	11	36.7
	Non anemic	27	90.0	19	63.3
2.1	**First trimester FBS**				
	Normal 65-110	30	100.0	30	100.0
2.2	**Second trimester FBS**				
	<65	0	0.0	1	3.3
	Normal 65-110	30	100.0	29	96.7
	>110	0	0.0	0	0.0
2.3	**Third trimester FBS**				

Table 3. (Continued)

No.	Laboratory Test	Study group		Control group	
		f	(%%)	f	(%)
	Normal 65-110	30	100.0	30	100.0
2.4	**Post-delivery FBS**				
	Normal 65-110	30	100.0	30	100.0
3.1	**Ist trimester glucose in urine**				
	Negative	30	100.0	30	100.0
3.2	**2nd trimester glucose in urine**				
	Negative	30	100.0	30	100.0
3.3	**354 trimester glucose in urine**				
	Negative	30	100.0	30	100.0
	*	0	0.0	0	0.0
3.4	**Post-delivery glucose in urine**				
	Negative	30	100.0	30	100.0
4.1	**Ist trimester protein in urine**				
	Negative	30	100.0	30	100.0
4.2	**2"d trimester protein in urine**				
	negative	30	100.0	29	96.7
	trace	0	0.0	1	3.3
	*	0	0.0	0	0.0
4.3	**3rd trimester protein in urine**				
	negative	26	86.7	24	80.0
	trace	2	6.7	2	6.7
	*	2	6.7	4	13.3
4.4	**Postdelivery protein in urine**				
	Negative	30	100.0	30	100.0

f= frequency, %%- percentage

This table depicted that the majority of those mothers was not anemic with respect to their groups and pregnancy, except that of pregnancy outcome in which few cases had anemia in both groups. Almost all mothers had no evidence of diabetes during and post pregnancy. Few cases had trace and one plus (+) of protein in urine during the third trimester of pregnancy.

Table 4. Comparison between the study and control groups relative to their nutritional knowledge through the pre test period

Mothers' Nutritional Knowledge			
t-obs.	**df**	**P-value**	**tcrit.**
1.837	**58**	**0.05**	**2.002**

df= **degree of freedom, p-va!ue= probability level, tobservedobserved t value, t- critical t-test value**

Table (4) revealed that both of the study and control groups had no difference relative to their nutritional knowledge prior to the implementation of the education program.

Table 5. Comparison between the study and control groups relative to their nutritional knowledge through the post test I period

Mothers' Nutritional Knowledge			
t-obs.	**df**	**p-value**	**tcrit.**
8.201	**38.34**	**0.05**	**2.024**

df=degree of freedom, p-va,ue= probability level, t-observed=observed t value, t- crit.= critical t-test value

This table indicated that there was a significant difference between the study and control groups' nutritional knowledge post implementation of the educational program.

Table 6. Comparison between the study and control groups relative to their nutritional knowledge through the post test 11 period

Mothers' Nutritional Knowledge			
t-obs.	df	P-value	t crit.
8.368	38.14	0.05	2.024

df=degree of freedom, p-value= probability level, t-observed=observed t value, t- crit.= critical t-test value

This table indicated that there was a significant difference between the study and control groups' nutritional knowledge post implementation of the education program.

Table ?.Comparison between mothers' nutritional knowledge with regard to their to their groups as study and control one's and the tests pre, post 1 post 11

NO.	Mothers' Nutritional Knowledge	Study	Control
		P-value (Sig.)	P-value (Sig.)
1	Pre test ك post test I	0.000	0.058
2	Pre test X post test n	0.000	0.051
3	post test 1 X post test n	0.014	0.054

p-value= probability level

Table (7) depicted that the study groups' nutritional knowledge had significantly changed as result of the educational program implementation with contrast to that of the control group's ones.

Discussion

Analysis of demographic characteristics indicated that the majority of the studied pregnant mothers was young ones who were (17-21) years old for both groups, with low level education (primary, and intermediate schools graduates) **(Table 1).** The findings had emerged due to the nature of the culture in which these mothers had lived, where the most predominant female issues were early marriage and low opportunity to complete their education.

Most of pregnant mothers for both groups was housewives. This is might be attributed to the reality of their culture where they live in extended families with moderate socioeconomic status **(Table 1).** These results reflect the nature of the social and economic reality of their families that willing to increase their members, because they do believe that these members were the bread winners for them. The majority of the pregnant mothers visit the primary health care center regularly. Those mothers in both groups had normal vaginal deliveries (N.V.D) **(Table 1).** The findings presented supportive evidence that these mothers had received appropriate primary health care at their reproductive age.

It was found that socioeconomic status is a risk factor for first birth at age (19) year or younger in married women in an urban area in Turkey [8].

It is supported that only one-third of all women is of (20-24) years old who had completed primary school where less education is associated with a higher rate of early childbearing [69].

It is also supported that the pregnant mothers who had low educational status and low income have an increased dependence on government support programs [1].

All of pregnant women in both groups had used iodized salt (Table 3), as it had been evidenced through laboratory test which interpreted in a way that the studied population for both groups had taken this salt with their foods in order to meet the body need with such mineral.

It is reported that salt iodization can eliminate the severe mental retardation that is associated with iodine deficiency of the fetus [H].

Through the application of mean and standard deviation, the comparison between the study and control group revealed that there was no significant difference relative to food groups, except that of grains at (p-value=0.05) (Table 2). These results shown that there are no differences through food intake of all items relative to food groups for both the study and control group, except that of grains where there was a difference between both groups.

The most widely used method of dietary variety includes determining intake from a food frequency questionnaire (FFQ) and identifying the unique foods consumption within various food groups. Dietary variety is determined by counting the number of uniquely food items consumed within a food group, regardless of the frequency (i.e., milk would only count once even if it was consumed every day), diet variety defined as the total number of unique food source within a macro nutrition category [11].

It is reported that the comparison of food groups should not be changed for either the study or control groups this indicated that there was no positive or negative effect on dietary behavior('?).

In the studied group, the laboratory tests were performed and the study findings shown in (Table3), hemoglobin (Hb), fasting blood sugar (FBS) and glucose and protein in the urine. The results that had emerged for hemoglobin in the three trimesters of pregnancy, anemia in pregnant mothers had not registered in the study group, but few cases which were appeared in the second and third trimester in the control group (Table 3), and this evidenced that the nutrition education program had its effectiveness on the study group than control group. While, the results of the pregnancy outcome indicated to anemic cases in both groups because of delivery, where the loss of fluids and blood.

The findings related to examine the sugar in the urine and in the blood (before breakfast) for both groups at all trimesters of pregnancy and its outcome had no any abnormal indicator according to the normal range of sugar in the blood and urine (Table 3), and these results pointing the nutritional status with respect to the existence of a state of dietary balance for the study group between the quantity and quality of food available, because of exposure of this group to educational nutrition program, while the control group is of imbalanced dietary status (quantity and not quality).

Results of the study showed the examination of protein in urine (Table 3) for the study group during the first and second trimesters of pregnancy and pregnancy outcome that there was no any abnormal cases according to the normal range. The results of examination of protein, except for the third trimester of pregnancy had presented four cases (two cases at trace, two cases at one plus +) respectively, without high blood pressure, in these cases preeclampsia had not existed, despite periodic follow-up through this trimester. While, the control group during the first trimester of pregnancy and pregnancy outcome had not presented any abnormal cases, but in the second trimester of the pregnancy reported one case

(one case at trace) and the third trimester of the pregnancy had emerged six cases (two cases at trace, and four cases at one plus) without hypertension, and in these cases preeclampsia had not existed.

It is reported that (21%) of postpartum anemia among low-income of (9129) woman who had normal hemoglobin in the third trimester('^).

It is supported that normal physiologic changes affect the hemoglobin (Hb) during pregnancy. Iron deficiency anemia approximately constitutes (75%) of anemic cases and folate deficiency megaloblastic anemia, which are more common in women who have inadequate diet and who are not receiving prenatal iron and folate supplements. Severe anemia may have adverse effects on the mother and the fetus. Anemia with hemoglobin levels less than (6 gr/dl) is associated with poor pregnancy outcome (14)·

It is found that decreased evaluation of Hb concentrations during pregnancy increase the risk of adverse birth outcomes such as preterm delivery, low birth weight, fetal death and intrauterine growth retardation (15).

Through the application of t-test for the comparison between the two groups, results had shown that there was no difference between the two groups in pre-test **(Table 4).** While, the results had shown the existence of difference in post test I and ⊓ between the two groups after the implementation of the program for the study group **(Table 5, 6).**

This had approved positively the influence of nutritional education program; **Table (6)** had shown the comparison Pair wise for more than two groups, results indicated dramatic change among tests, such as pre, post I and post ⊓ between the study group and the control group **(Table 7),** that explained the nutritional education program had achieved its objectives in improving the nutritional knowledge among pregnant mothers in the study group

It is indicated that confirmed results from the pre/post knowledge questionnaire indicated a significant improvement in participants' nutrition knowledge score.

Total mean for pre-test scores was (59%) and post-test scores was (87%), representing ɜ significant (28%) increase in knowledge scores at the study group. In comparison, no change was seen in the pre-and post-knowledge scores of the control group (68% and 70%, respectively) ('2).

Conclusions:

The study concluded that the Nutrition Education Program can be considered an effective mean for the reinforcement and improvement of the pregnant mother's nutritional knowledge and pregnancy outcome.

Recommendations:

The study recommended that pregnant mothers' nutritional knowledge has to be motivated for purpose of preventing pregnancy-associated nutritional problems and further studies can be conducted with respect to the implementation of the present Nutrition Education Program on large sample size of pregnant mothers.

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