Effect of Nutritional Educational Guideline among Pregnant Women with Iron Deficiency Anemia at Rural Areas in Kalyobia Governorate

Howyida S. Abd ElHameed[1], Aziza I. Mohammed[2] and Lamiaa T. Abd El Hameed[3]

[1]Community Heath Nursing Department, [2]Maternal and Newborn Health Nursing Department, Faculty of Nursing ,
Benha University [3] Agriculture Economic Department faculty of Agriculture Benha University
elmokhtar.mohamed@yahoo.com

Abstract: All pregnant women are at risk for becoming anemic, that is because iron need for mother and fetus gradually increases during pregnancy and reaches its highest level at the end of the pregnancy. The aim of this study was to evaluate the effect of a nutritional educational guidline (NEG) on knowledge and knowledge related practice of pregnant women with iron deficiency anemia (IDA) at rural areas. The intervention design was conducted at three maternal and child health care centers in Kalyobia Governorate (Moshtoher, Kafr Shoukr, and Kaha). A total 200 rural anemic pregnant women were selected from these maternal and child health centers. One tool was utilized in this study, a structured interviewing questionnaire for assessment of the studied sample characteristics and their knowledge regarding iron deficiency anemia as well as their knowledge related practice. A significant increase in overall knowledge and knowledge related practice toward healthy nutritional habits after intervention was detected and subsequently the prevalence of anemia slightly decreased after intervention of the NEG (24%), than before**.** This study clearly showed that NEG can bring about an improvement in knowledge and knowledge related- practice of pregnant women toward IDA. The study recommended that nutrition should be mandated as a required component of comprehensive health care putting clear guidelines of the nutrition services, that nurse should provide to the pregnant women in primary health care facilitation in order to maintain proper health among pregnant women. Follow up HB level though pregnant women in rural area should be taken for early detection of anemia.
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Key words: Nutritional educational guideline (NEG), iron deficiency anemia (IDA), pregnant women, rural area.

1. Introduction

Iron deficiency anemia is an important public health problem for pregnant women, living in developing countries,[1] affecting two thirds of pregnant women and contributing to maternal morbidity and mortality and to low birth weight[2]. Multiparty, poor socio economical and educational statuses are the principal reasons for high prevalence of anemia in development areas [3]. It is estimated that 20 – 50% of the world population is suffering from iron deficiency anemia. Iron deficiency is believed to be the most common cause of anemia in pregnancy[4]. Iron deficiency anemia does not only affect the mother but also has impact on cognitive and psychomotor functions and anemia in infant[5]. The WHO classifies the countries with prevalence of anemia higher than 40% as the countries, where anemia is a problem of public health significance [6]. It is defined by the WHO as HB less than 11gm in pregnancy, and is divided into three degrees; mild (9.0 –10.9%gm), moderate (7.0-8.9%gm) and severe degree (<7.0% gm) [7]. Anemia is more common in women especially if they are young, poor, pregnant or members of an ethnic minority[8]. It is the most common medical disorder in pregnancy related to increase maternal and prenatal morbidity, therefore antenatal care should be done for early detection and management[9]. The prevalence, etiology and degree of severity vary in different populations, it is 35% for non pregnant women, and 51% for pregnant women globally, and 3 – 4 times higher in developing countries [10]. In south Asia the prevalence of anemia among pregnant women is as high as 65%, in Indonesia, the prevalence of nutritional anemia based on scattered surveys, is between 50% and 70%[11]. Nursing responsibility for prenatal care includes physiological and psychological assessment of health, health education counseling for pregnant women identification of needs with appropriate community and specially referrals and provision of health promotion such as adequate nutrition, proper exercises and planned care[12].

Aim of study:

The present study aimed to evaluate the effect of **a** nutritional educational guideline on knowledge, and knowledge- related practice among pregnant women with iron deficiency anemia at rural areas.

This aim was achieved through the following:

1- Assessing the prevalence of anemia among pregnant women.

2- Assessing knowledge and knowledge- related practice of   pregnant women regarding iron deficiency anemia.

3- Designing and implementing a nutritional educational guideline for pregnant women with IDA regarding knowledge related to IDA risk factors, iron rich foods and importance for intake of iron supplementation and their practice toward iron intake .

4- Evaluating the effect of nutritional educational guideline on prevalence of anemia among pregnant women, and their knowledge and knowledge related - practice regarding IDA.

Hypothesis:
1. Nutritional educational guideline improves knowledge and knowledge -related practice of pregnant women regarding IDA.
2. Prevalence of anemia is expected to be reduced among participant women.

2. Subjects and Methods
Research design:
An intervention study design was used.
Setting:
The study was conducted at three maternal and child health centers (**MCH)** in Kalyobia governorate, namely; Moshtoher, Kafr Shoukr & Kaha. These villages were selected as having the highest density of population, and each center is serving around 8.000-15.000 population of its catchment area.

Sample and sampling technique
Recruitment for the study sample included a total of 200 pregnant women, with IDA, at age group from 25–35 years, from different social levels, prime and multi gravid at the second trimester, can read and write, and resident at the selected rural areas. In additition, attending for follow up antenatal visit, mothers suffering from only anemia during pregnancy (HB less than 11gm), free from any medical disorders, and who attended at the selected MCH centers in a period of around 6 months from July 2011 to December 2011.

Tools of data collection: One tool was used:-
 An Interviewing questionnaire:
It was designed by the researchers after reviewing of related literature. To collect the necessary data that cover the aim of the study, the interviewing questionnaire was used pre / post intervention. It involved both open/close ended questions. The time consumed to fill in the questionnaire was about 15 minutes. It consisted of four parts:

First part:

It covered the general characteristics, obstetric history, IDA prevalence among pregnant women.
Second part: It dealt with women's knowledge regarding IDA meaning, causes, symptoms, prevention, risk factors, source of iron rich foods, importance of iron supplementation, ect.) Knowledge scoring system:
Were scored as one score given for a correct answer while zero for an incorrect answer. Total knowledge scores were categorized as: >50% (0-10 score) poor knowledge; 50-75% (11-17) average knowledge; and ≤ 75% (18-22) good knowledge.

Third part:
It was used to assess women s' knowledge-related practice regarding eating iron rich food, don't drink tea with meals, regular intake of iron supplementation, and use of orange juice with iron supplementation. It was scored one score for an answer done, and zero score for an answer not done. Total knowledge-related practice scores were evaluated as >50% (0-7), unsatisfactory knowledge-related practice; and ≤ 50% (8-15) satisfactory knowledge- related practice.

Fourth part:
It is concerned with assessment of complete blood count through review of the studied women record to assess the prevalence and severity of anemia among them. It was repeated after treatment to evaluate their responses to treatment. Hemoglobin levels (Hb) were taken pre / post NEG intervention from studied women's records. The degree of anemia was estimated according to cut off point of the WHO (2001), it is divided into three degrees in relation Hb level as mild (9.0–10.9%gm), moderate (7.0-8.9%gm) and severe degree (<7.0% gm) [13].

Pilot Study:
A pilot study was carried out on 20 anemic pregnant women (10%) to test the tool content, applicability, clarity and time needed to fill in the sheet using the interviewing questionnaire. Some modifications and rephrasing of certain questions were done after validity of content was measured by four experts in the field of obstetric and community health nursing to test relevance and completeness of the tools. Those participants were excluded from the main study sample.

Study procedure
The study was conducted in three phases:

Phase one
An official approval was obtained to conduct this study according to a letter issued from the Dean of the Faculty of Nursing, Benha University to each MCH

centers director. Data were collected from the three MCH centers at Kalyobia Governorate over a period of 6 months from beginning of July 2011 to end of December 2011. Each of the MCH centers was visited two days/week. Each pregnant woman was interviewed for around 15 minutes to assess her knowledge and knowledge- related practice.

Phase two

A nutritional educational guideline regarding iron deficiency anemia was developed and intervened by the researchers for each pregnant woman. Two sessions were applied at the end of the day to clarify any questions asked by pregnant women; duration of each session was 2 hours, different teaching methods as lectures, group discussion, and demonstration were utilized. Each woman was informed about the time and place of each session.

Phase three

To evaluate the effect of nutritional guideline women`s knowledge and knowledge -related practice, the same format of interviewing questionnaire was utilized 3 months post intervention.

Ethical considerations

An oral consent was obtained from each mother who agreed to participate in the study in order to gain their cooperation. They were assured about confidentiality of information given and that it well be used only for the purpose of the study. They were also informed about their right to withdraw from the study at any time without giving any reason.

Statistical design:

The collected data were analyzed, simple statistic tests as frequency, percentage, arithmetic mean and standard deviation were used to present collected data. The level of significance was considered at $p<0.05$, and $P < 0.001$.

3.Result:

Table (1) shows personal characteristics of the studied pregnant women. It reveals 50% of them had 18-32 years old, with a mean of 26.43±4.38.As regards educational level, 42.5% of them had university educational level, 58% and 46.5% of them were not working and have low income respectively.

Table (2) indicates obstetric history of the studied pregnant women, the mean gestational age among the studied group was14.80±1.30 weeks, and 49.5% of them were grand multipara. 43.7% of them have more than 3 years regarding birth spacing.

Table (3) displays the comparison between mean scores of studied sample knowledge before the nutritional educational guideline intervention and after three month. There were highly statistically significant differences between knowledge mean scores of

studied pregnant women before and after intervention $p< 0.001$.

Figure (1): illustrates that more than three quarters of the studied sample (78%) had a good total knowledge score regarding iron deficiency anemia after intervention of nutritional educational guideline

Table (4): shows that there were highly statistically significant differences ($p<0.001$) between mean score of all knowledge related practice items of the studied women regarding iron deficiency anemia pre/post intervention, except for eat regular frequent meals where it was only significant ($P <0.005$).

Figure (2): Illustrates that less than three-quarter (71 %) of the studied women had a satisfactory knowledge- related practice after implementation of NEG, and 29% had unsatisfactory knowledge related practice as compared with 82% at pre-intervention.

Figure (3): Represents the prevalence of anemia among studied pregnant women before and after three months of NEG intervention. The figure shows that 24% of studied pregnant women had a normal level of hemoglobin and became free from anemia after 3 month post NIG intervention.

Table (1): Personal characteristics of the studied pregnant women(n=200).

Personal Characteristics	NO	%
Age(in years)		
18-	60	30
25-	100	50
≥32	40	20
Mean± SD	26.43±4.38	
Level of education:		
Preparatory	33	16.5
Secondary	82	41
University	85	42.5
Family income:		
High	35	17.5
High middle	16	8.0
Low middle	93	46.5
Low	56	28.0
Occupation :		
Working	84	42
Do not work	116	58

Table (2): Obstetric history of the studied pregnant women (n=200).

Obstetric history	Frequency	%
Gestational age in weeks:		
13-	68	34
18-	32	16
23-28	100	50
Mean± SD	14.80±1.30	
Parity:		
Primigravida	58	29
Multipara	43	21.5
Grand multipara	99	49.5
Birth spacing in years(n=142):		
< 1	25	17.6
1-3	55	38.7
>3	62	43.7

Table (3) Comparison of mean score of knowledge of the studied pregnant women regarding iron deficiency anemia (IDA) pre / post nutritional educational guideline intervention (N=200).

Women's Knowledge	Pre intervention NEG Mean ±SD			Post intervention NEG Mean ±SD			Paired t test	*P* value
Meaning of IDA	0.26	±	0.59	0.93	±	0.72	23.62	≤0.001**
Causes of IDA	1.11	±	0.43	1.54	±	0.34	15.39	≤0.001**
Signs and symptoms of IDA.	0.82	±	0.66	1.56	±	0.45	18.11	≤0.001**
Effect of IDA on pregnant women	0.56	±	0.40	1.50	±	0.52	15.24	≤0.001**
Effect of IDA on the neonate	0.46	±	0.45	0.83	±	0.80	12.27	≤0.001**
Measures of prevent IDA	0.42	±	0.78	1.35	±	0.45	18.80	≤0.001**
Risk factors of IDA	0.56	±	0.61	1.32	±	0.43	20.42	≤0.001**
Sources of iron rich foods	1.08	±	0.71	1.57	±	0.67	15.33	≤0.001**
Importance of iron supplementation	1.01	±	0.87	1.56	±	0.74	18.96	≤0.001**
Side effects of iron supplementation	1.43	±	0.70	1.42	±	0.70	18.58	≤0.001**
Measures to control iron supplementation side effects	0.50	±	0.79	1.41	±	0.75	16.88	≤0.001**

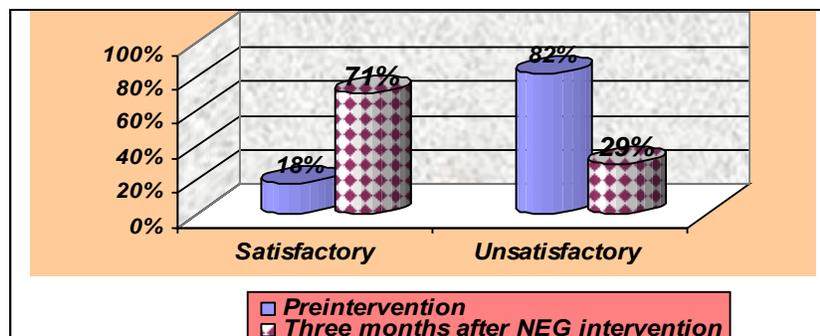**** Highly statistically significant difference (p≤0.001)**
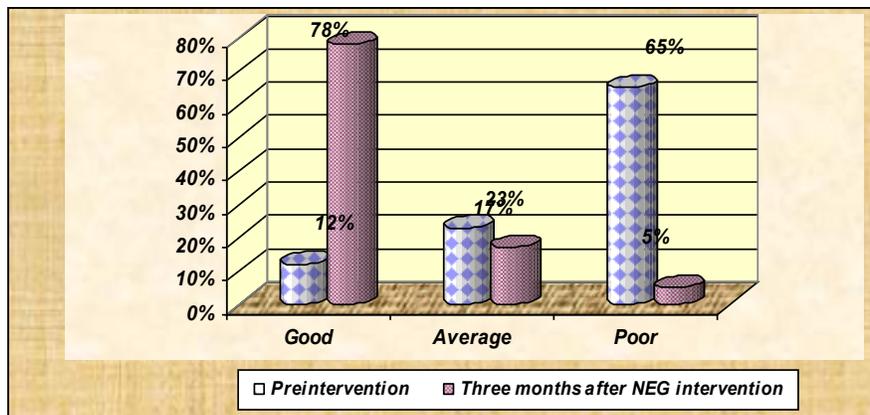
Figure (1): Percentage distribution of the studied pregnant women regarding their total knowledge score pre and three months after intervention of nutritional educational guideline.

Table (4): Comparison of mean score knowledge related practice of the studied pregnant women regarding IDA pre / post nutritional educational guideline intervention (n=200).

Women s' Practice		Pre-intervention		Post Three month after intervention		x^2	*P* value
		No	%	No	%		
Eating iron rich foods	*Done*	57	48.5	122	66	63.15	≤0.001**
	Not done	143	71.5	78	34		
Don't drink tea with meals	*Done*	153	76.5	136	68	81.93	≤ 0.001**
	Not done	47	33.5	64	32		
Regular use of iron supplementation	*Done*	35	17.5	152	76	57.53	≤ 0.001**
	Not done	165	82.5	48	24		
Administer iron supplementation	*Done*	72	34	168	84	56.74	≤ 0.001**
	Not done	128	64	32	16		
Eat regular frequent meals	*Done*	65	32.5	165	82.5	64.06	<0.05*
	Not done	135	67.5	35	17.5		
Use iron supplementation with milk	*Done*	28	14	110	55	81.68	≤ 0.001**
	Not done	172	86	90	45		
Use iron supplementation with fruit juice	*Done*	31	15.5	104	52	73.42	≤0.001**
	Not done	169	84.5	96	48		

*Statistically significant difference ($p \leq 0.05$).** Highly statistically significant difference ($p \leq 0.001$)

Figure (2): Percentage distribution of the studied pregnant women regarding their total practice score pre and three months after intervention of nutritional educational guideline.

4. Discussion

Anemia in pregnant women constitutes a real concern all over the world more so in developing countries. Various studies have reported variable prevalence rates of anemia during pregnancy and it varies from 33% to 75 %. [14,15]. The current study aimed to evaluate the effect of nutritional educational guideline on knowledge and knowledge- related practice of pregnant women with iron deficiency anemia at rural areas. According to the study findings, a total 200 pregnant women with iron deficiency anemia, residing rural areas with a mean age of 26.43±4.38 years, and almost three fifths of them were not working.

As regards obstetric history of studied pregnant women, the mean of gestational age was 14.80±1.30 weeks, about half of them were grand multipara, and more than two fifths of them have more than 3 years regarding birth spacing. These findings were supported by **Schweitzer** [16] who pointed out that the prevalence of iron deficiency anemia increased with parity women with more than four children). In another study, done by **Malhotra et. al.** [17] there results showed that repeated pregnancies is a factor for development of iron deficiency anemia in subsequent pregnancy.

The current study indicates that there were a highly statistically significant differences ($p<0.001$) in relation mean scores of both knowledge and knowledge- related practice of studied pregnant women regarding iron deficiency anemia per versus after intervention of NEG. This might be due to that the implementation of the NEG. helped pregnant women to identify different sources of iron rich foods, regulate their time to take iron supplementation, and overcome side effects of iron supplementation. These findings agreed with those of a similar study carried out by **El Sayed** [18]. Who mentioned that all rural pregnant women had knowledge about different sources of iron rich foods.

In addition, **Pernilia et al.,** [19] highlighted the importance of health education to prevent iron deficiency anemia among pregnant women in developing countries to decrease maternal morbidity and mortality rate among women in reproductive age and, prevention of any corresponding complications regarding their future. Moreover, the **WHO** [13] recommended that the recent guidelines regarding prevention and control of iron deficiency anemia, are the most effective ways needed to decrease them. The current study estimated that, the prevalence of iron deficiency anemia among studied pregnant women was decreased after utilization of nutritional educational guideline, and approximately one quarter of the studied pregnant women had a normal hemoglobin level post intervention.

Conclusion

According to the result of the present study, it could be concluded that the prevalence of iron deficiency anemia among studied participants was still high after the NEG intervention except for only 24% of them who were treated and had normal hemoglobin level, and there was a highly statistically significant improvement regarding knowledge and practice of the studied pregnant women after intervention of NEG.

Recommendations:

- Follow up should be carried out to early detection of iron deficiency anemia among pregnant women at rural areas.
- Available booklet in certain knowledge about IDA in MCH centers should give to all pregnant women.
- Health education to all attending pregnant women in MCH centers are provide about balanced diet and source of iron rich food.
- Nurses should have regular, ongoing, specialized in-service training programs about prenatal nursing care. As well, nursing care standards should be applied in MCH centers to improve the care provided for pregnant women.
- Further study is needed to be conducted on a larger simple and different geographical settings to generalize the results of the study.

Corresponding author
Howyida, S. Abd ElHameed,
Community Health Nursing Department
Faculty of Nursing, Benha University
elmokhtar.mohamed@yahoo.com

5.References

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