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Call For Change Level Of Knowledge, Awareness And Attitude To Follow A High Folate Diet Among Pregnant Women.

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Abstract:
Background: *Official health education initiatives have promoted folic acid (FA) supplementation and a diet rich in folate through mass media, including TV, newspapers, and magazine articles worldwide. Public health campaigns aimed to increase awareness, knowledge, and periconceptional use of FA should concentrate on using appropriate intervention methods worldwide. The CDC recommends that all women of childbearing age consume 0.4 mg of FA per day and 5 mg for women at higher risk of neural tube defects (NTDs).* ***Aim:*** *assess women's levels of knowledge, attitude regarding FA intake.* ***Method:*** *Descriptive cross-sectional study design was used. The study was conducted in antenatal care units which affiliates to 5 settings in Beni-Suef city on a total of 500 pregnant women. Using a structured interview questionnaire to collect data.* ***Results:*** *The findings of this study indicated that, most of studied women (96.1%) who don't know proper time of folic acid intake didn't know it's benefits, three quarters (75%) of those who mentioned that is not important to take folic acid during pregnancy didn't know it's proper time of intake, more than half (55.6%) of those who reported preconception as a proper time for folic acid intake to help ensure women have a healthy baby.* ***Conclusion:*** *Based on the findings of the present study, it can be concluded that, there is a lack of effective public awareness program regarding the importance of periconceptional administration of FA to reduce risk of NTDs*
Keywords: *Folic acid - Awareness - neural tube defects .*

I. Introduction

Adequate quantities of vitamins and minerals are essential for the development of the embryo, fetus, and neonate. These substances are involved in cell growth and differentiation and are central components of cell structure, cell signaling, protein translation, enzymes, catalytic enzyme sites, and enzymatic reactions. Together, these processes are critical for organ development in the fetus. The critical period of organogenesis occurs at 20 to 60 days gestation [1].

Official health education initiatives have promoted folic acid (FA) supplementation and a diet rich in folate through mass media, including TV, newspapers, and magazine articles worldwide [2]. Public health campaigns aimed at increasing awareness, knowledge, and periconceptional use of FA should concentrate on using appropriate intervention methods worldwide [3].

The Center for Disease Control (CDC) recommends that all women of childbearing age consume 0.4 mg of FA per day and 5 mg for women at higher risk of neural tube defects (NTDs) [4]. To significantly reduce the occurrence and recurrence of NTDs which are birth defects of the brain and spine that can result in varying degrees of paralysis, loss of bowel and bladder contro ,and even death. The toll of NTDs on affected families and infants is not only physical and emotional, but financially as well. The average lifetime cost of caring for a child born with spina bifida, the most common of these birth defects, is estimated at approximately $636,000 per child and can often surpass $1 million [5].

The minimum recommendation by health authorities is 0.4 mg FA supplementation in pregnancy. Studies of FA dosing have ranged up to 10 mg during pregnancy without any reported adverse events [6]. If this guideline is followed, an estimated 50% to 70% of NTDs could be prevented [7]. In an effort to better understand the stagnancy of reported use of FA supplements in the face of global efforts to increase awareness and knowledge about FA, this research study will identify and describe the relationship of reported awareness and knowledge of FA to regular consumption of a vitamin containing FA.

II. Significance Of The Study

In Egypt the frequency of congenital malformations (CMs) among children aged 0–18 years was 2%. The estimated incidence of CMs of the Central Nervous System (CNS) is 26.92%. Frequency of NTDs is 29.57% of that of the CNS [8]. Anomalies of the CNS are considered the most common anomalies in live born and still born in Egypt as well as in other countries [9]. The findings of this study will provide a description about the knowledge about FA.

III. Aim of The Study

The aim of the study was to assess women's levels of knowledge, attitude regarding FA intake and their determinants of its usage for the prevention of NTDs among pregnant women.

IV. Research Question

Are the pregnant women attending the antenatal clinics have knowledge & perception about FA and its benefits?

V. Subjects & Method

Research design: A descriptive cross-sectional study design was selected for the current study.

Research Setting: The study was conducted in antenatal care units which affiliates to 5 settings in Beni-Suef city. These settings include; Three Primary Healthcare Centers (PHCs), Beni-Suef University and General Hospital

Subjects: A sample entailed of 500 pregnant women.

VI. Tool of Data Collection

A structured interview questionnaire, based on the literature review after modifying it to simple Arabic language for the suit women's level of understanding, was developed by the researchers, to collect data which included: - Socio demographic data as; age, consanguinity, level of education, etc.., Obstetric History, questions about knowledge of FA among women in child bearing age. Folic acid intake was recorded into 3 categories:

- Adequate use: reported use before & during pregnancy.
- Sub-adequate use: reported use before or during pregnancy only.
- Never used: reported not taking supplements before and during.

VII. Methods of Data Collection

This study was covered in the following phases:-

- **Validity Of Tool**

Five experts reviewed the content validity of the tool from maternity and gynecological nursing professors and obstetric and gynecologic medical professors.

- **Reliability:**

Confirming the stability of the questionnaire, Cronbach's alpha was used because it gives the minimum reliability coefficient scale.

- **Administrative & Ethical Considerations**

Researchers took approval from setting directors before starting the research in order to allow them to take the sample. A written permit clarifying the purpose of the study was obtained from the director of the PHCs, University and General Hospital. An informed consent to conduct the study was taken from each studied women to protect their rights before the start of the study.

- **Pilot Study**

It is approximately 10% of the study sample, which was equal to 50 to ascertain the relevance of the tools, and estimate the length of the time needed to fill the sheet.

- **Field Work**

The researcher identified herself to the subjects and explained to them the nature of the study, its importance and procedures to be performed.

Data collection took about 45 minutes for each woman to fill a questionnaire on the scheduled days for antenatal care in the selected settings as: Saturday, Monday, and Wednesday from 9:00 Am until 12:00 Pm in

the antenatal units. The assessment of data took 8 months to be collected during the period from January 2013 to August 2013.

Finally, the researcher constructed a categorization both for the studied women's knowledge about FA intake pre and during pregnancy as follows: inadequate if < 60% of all questions were answered correctly, adequate knowledge was considered if 60 of all questions were answered correctly. A scoring system of perception also took negative if < 60% of all statements were answered correctly, positive perception was considered if 60 of all statements were answered correctly.

- **Statistical Design**

All the statistical analysis was performed using SPSS package version 20. Collected data were coded and analyzed.

- Description of quantitative variables as mean and SD (Mean ± SD)
- Statistical associations between pairs of categorical variables were assessed using $\chi 2$ tests
- The graphical presentation included Area chart diagram.
- Probability (p-value) was considered as follows:

P value > 0.05 insignificant
* P (0.05 mild significant correlation
** P (0.01 moderate significant correlation
*** P < 0.001 highly significant correlation

VIII. Results

The distribution for the studied sample as regards their sociodemographic characteristics is presented in figure (1). It shows that near to half of the studied women (48.6%) were in the age group ranging from 25-34 years, approximately two thirds of them (65%) had no consanguinity with their husband , according to place of residence as the table shows that more than three quarters (77%) were living in urban areas, the majority of them (93%) were housewives , and more than half of women (59.2%) were of extended family type.

It is clear from table (1) that most of studied women (96.1%) who don't know proper time of folic acid intake didn't know it's benefits, three quarters (75%) of those who mentioned that is not important to take folic acid during pregnancy didn't know it's proper time of intake, more than half (55.6%) of those who reported preconception as a proper time for folic acid intake to help ensure women have a healthy baby, more than half (54.8%) of those who mentioned importance of folic acid intake pre and during pregnancy to decrease risk of NTDs and more than one third (36.9%) of those who mentioned during pregnancy as a proper time of intake to help your baby create RBCs. Near to half (44.4%) of the studied women were attributed to a higher degree of knowledge by reporting that folic acid should be taken before pregnancy to prevent birth defects.

Table (2) shows statistically significant independent factors affecting the studied women's awareness. More than one third (44.4%) of those who reported hearing about folic acid had secondary education, more than two thirds (74%) from rural area, more than half (59%) had parity ranged from 1-2, and more than three quarters (78.8%) had planned pregnancy, this table also shows that more than three quarters (85.3%) of their initial visit was in 1st trimester with statistic significant difference (p = 0.000, 0.008, 0.064, 0.003, and 0.000) respectively.

Regarding to the studied women's opportunity to receive timely counseling about folic acid intake, **it is obvious from table (3)** that more than three quarters (79.9%) with planned pregnancy, (88.4%) their initial visit were in 1st trimester, more than one third (38.4%) of them had nine or more prenatal visits, and near to half (46.3%) of them performed obstetrics and gynecology visits. There is statistic significant difference (p=0.001).

Table (4) reveals that the studied women who reported folic acid intake had more than three quarters (85.0%) positive perception, and 90.4% awareness about folic acid with statistic significant difference (p=0.001).While 74.0% of those who reported folic acid had inadequate knowledge with no statistic significant difference (p = 0.100).

It is obvious from Table (5) that more than one third (42.8%) of studied women who reported folic acid intake listed that; macrocytic anemia is the mean complication associated with deficiency of folic acid intake, while only 18.4% of them listed NTDs as a mean Complication, 0.8% listed other Complications as bad development of fetus, Preterm birth, gestational diabetes, General sickness, weakness, decrease calcium in mother and fetus, and pregnancy induced hypertension (PIH) with statistic significant difference (p = 0.000).

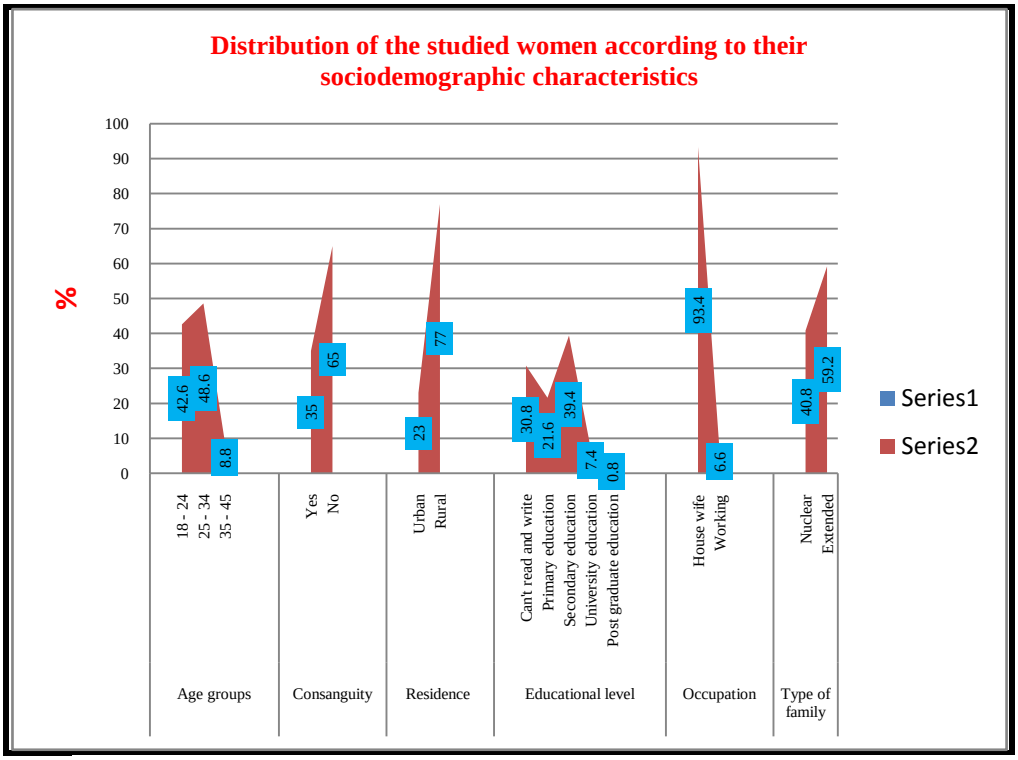

Figure 1: Distribution of the studied women according to their sociodemographic characteristics

Table 1: Distribution of the studied women who knew that folic acid is needed before pregnancy and prevent birth defects "Advanced Knowledge"

Why it is important to take Folate or folic acid before or during pregnancy	**You should start to increase your folate and folic acid intake**											
	Before pregnancy		During pregnancy		Before and during		At no stage, don't need to		Don't know		Total	
Helps ensure women have a healthy baby	5	55.6	80	29.9	13	20.3	0	0.0	3	1.9	101	20.2
Decreases the risk of NTDs	4	44.4	76	28.3	35	54.8	0	0.0	2	1.3	117	23.4
Help your body create RBCs	0	0.0	99	36.9	15	23.4	1	25.0	1	0.6	116	23.2
Don't know	0	0.0	13	4.8	1	1.6	3	75.0	149	96.1	166	33.2
Total	9	100	268	100	64	100	4	100	155	100	500	100

Table 2: Relationship between folic acid awareness and the studied women's **characteristics**

Variable	***folic acid awareness***						***P. value***
	yes		No		Total		
	No.	%	No.	%	No.	%	
Age groups							
18-24	149	41.5	63	43.2	210	42.0	0.436
25-34	177	50	66	45.2	243	48.6	
35-45	30	8.5	17	11.6	47	9.4	
Mother educational level							
Can't read and write	85	24	69	47.3	154	30.8	0.000***
Primary education	74	20.9	34	23.3	108	21.6	
Secondary education	157	44.4	40	27.4	197	39.4	
University education	36	10.2	1	.7	37	7.4	
Post graduate education	2	0.6	2	1.4	4	0.8	
Residence							
Urban	92	26	23	15.8	115	23	0.008**
Rural	262	74	123	84.2	385	77	

Previous pregnancy complications							
Yes	143	40.4	52	35.6	195	39	0.185
No	211	59.6	94	64.4	305	61	
Parity							
0	85	24	30	20.5	115	23	0.064
1 - 2	209	59	77	53	286	57.8	
2 - 4	57	16	25	17.1	82	16.4	
5+	7	2.0	10	6.8	17	3.4	
last pregnancy							
Planned	279	78.8	97	66.4	376	75.2	0.003**
Unplanned	75	21.2	49	33.6	124	24.8	
Initial visit							
1st trimester	302	85.3	77	52.7	379	75.8	0.000***
2nd trimester	34	9.6	49	33.6	83	16.6	
3rd trimester	14	4	14	9.6	28	5.6	
Un known	4	1.1	6	4.1	10	2	

Table 3: Relationship between folic acid intake and the studied women's Opportunity to receive timely counseling regarding folic acid intake

Variable	*Do you currently take a folic acid supplement*						*P. value*
	Yes		**no**		**Total**		
	No.	**%**	**No.**	**%**	**No.**	**%**	
Last pregnancy							
Planned	283	79.9	93	63.7	376	75.2	0.001***
Unplanned	71	20.1	53	36.3	124	24.8	
Initial prenatal visit							
1st trimester	313	88.4	66	45.2	379	75.8	0.001***
2nd trimester	27	7.6	56	38.4	83	16.6	
3rd trimester	11	3.1	17	11.6	28	5.6	
Unknown	3	0.8	7	4.8	10	2.0	
Number of Prenatal visits							
1-4	81	22.9	78	53.4	159	31.8	0.001***
5-8	128	36.2	36	24.7	164	32.8	
9+	136	38.4	25	17.1	161	32.2	
Unknown	9	2.5	7	4.8	16	3.2	
What about Health care access							
Having a regular provider for health care	22	6.2	3	2.1	25	5.0	0.001***
Preventive check up with in the past year	4	1.1	4	2.7	8	1.6	
OB/GYNE visits	164	46.3	67	45.9	231	46.2	
Pregnancy counseling in MCH	28	7.9	24	16.4	52	10.4	
Did not fill prescription due to cost	9	2.5	18	12.3	27	5.4	
OB/GYNE visits and MCH	127	35.9	28	19.2	155	31.0	
No follow up due to religion belief	0	0.0	2	1.4	2	0.4	

Table 4: Relationship between folic acid intake and the studied women's **knowledge, awareness, and perception**

Variable	*Do you currently take a folic acid supplement*						*P. value*
	Yes		**no**		**Total**		
	No.	**%**	**No.**	**%**	**No.**	**%**	
Level of perception							
Positive	301	85.0	119	81.5	420	84.0	0.001***
Negative	51	14.4	29	19.8	80	16.0	
Knowledge							
Adequate	91	25.7	7	4.7	98	19.6	0.100
in adequate	261	74.0	141	96.6	402	80.4	
Awareness of Folate and folic acid							
Yes	320	90.4	38	26	358	71.6	0.001***
No	32	9.0	110	75.3	142	28.4	

Table 5: Relationship between folic acid intake and the studied women's **knowledge of complications associated with its deficiency**

Variable	*Do you currently take a folic acid supplement*						*P. value*
	yes		no		Total		
	No.	%	No.	%	No.	%	
Complications associated with deficiency of folic acid intake							
NTDs	65	18.4	10	6.8	75	15	0.000***
Macrocytic anemia	135	42.8	14	9.5	165	33	
Limb numbness, nerve damage	6	1.7	1	0.7	7	1.4	
Pregnancy complication	68	19.3	7	4.8	75	15.0	
Don't know	48	13.6	110	74.8	158	31.8	
Others	3	0.8	1	0.6	4	0.8	
Proper time of intake							
Before pregnancy	8	2.2	1	.6	9	1.8	0.000***
During pregnancy	244	69.3	24	16.3	268	53.6	
Before and during	57	16.1	7	4.7	64	12.8	
At no stage, don't need to	0	0.0	4	2.7	4	0.8	
Don't know	43	12.2	112	76.1	155	31.0	
Other ways to get folic acid							
Take supplements	89	25.2	15	10.2	104	20.8	0.000***
Eating fortified foods	30	8.5	10	6.8	40	8.0	
Eating diet with vitamins	38	10.7	35	23.8	73	14.6	
No other ways, none	5	1.4	3	2	8	1.6	
Don't know	190	53.9	85	57.8	275	55.0	

IX. Discussion

As a significant cause of morbidity and infant mortality, neural tube defects such as spina bifida and anencephaly represent a worldwide public health concern. Globally, NTDs affect more than 300,000 pregnancies annually; approximately 3,000 of those occur in the U.S [10]. Studies have also shown that 50-80% of NTDs can be prevented if a woman consumes a sufficient amount of FA (0.4mg) daily before conception, and throughout the first trimester of her pregnancy [11].

According to the studied women sociodemographic characteristics, the result of the present study showed that the mean age was 26.115 ± 5.515, while 39.4% of them had secondary education, and the majority of them (93.4%) were housewives.

The present study findings revealed that the majority of the studied women had an inadequate level of knowledge about FA. These results contradicted with findings of Riazi et al. (2012) in Iran who reported that the knowledge of most respondents (43.8%) were in the intermediate level, and only a few of them (7.8%) had the high level of knowledge [12]. As well as results of Al-Hossani et al., (2005) who studied knowledge and practices of pregnant women about FA in pregnancy in Abu Dhabi, United Arab Emirates and found that 46.6% had accurate/partially accurate knowledge [13]. The current results may be due to the majority of women were complaining of lack of physician clarification of their instructions, so they didn't receive enough knowledge about FA even if a large number of them demonstrated routine prescription of it.

Regarding the studied women's knowledge of FA benefits "general knowledge", the present study revealed that only 23.4% had a general knowledge "FA decrease the risk of NTDs". These results are in line with findings of Nosrat et al., (2012) in Iran [14], who studied knowledge and practice of urban Iranian pregnant women towards FA intake for NTDs prevention, results of Reeves et al., (1998) in Michigan [15], who investigated the knowledge and use of FA among women of reproductive age, and findings of Vollset and Lande (1998) in Norway [16], who studied knowledge and attitudes of folate and use of dietary supplements among women of reproductive age and reported that (27.6%, 30.0%, and 33%) respectively knew that the folate was something important in the prevention of NTDs.

Regarding the opportunity to receive timely counseling about FA supplementation, when refer to pregnancy planning, the result of the present study showed that 75.2% of the women had a planned pregnancy. These findings are in agreement with the result of Wilton & Foureur (2009) in Dubai [17], who reported that almost two thirds (67.7%) of women indicated their pregnancies were planned, as well as results of Riazi et al.,

(2012) who reported that 79.8% of the women had a planned pregnancy [12]. According to the present study large percentage of women had low parity, so they had opportunity to plan their pregnancy. It is important to refer to the factors appeared in the present study to affect the pregnant women opportunity to receive advice regarding the benefits of FA intake; women of low experience "lowest education, and age" with their risk of inadequate intake of FA prior to conception and during the first trimester of pregnancy.

Moreover, a substantial number of unintended pregnancies may occur among women using hormonal contraceptives. Therefore, women should be advised to take FA every day, regardless of whether they use contraceptives. Also, women planning a pregnancy should know the importance and the correct time frame of using FA.

As regard to access to initial antenatal visit, the findings of the present study revealed that 75.8% of the studied women had initial visit in 1st trimester. This result is in opposite direction with Mohammed (2012) who assessed pregnant women knowledge about teratogenicity of drugs in Egypt and who reported that only 12% of the women attending antenatal clinic during first trimester. Findings of the present study supported the fact that women during pregnancy are more conscious of food and health issues, and this indicated by high level of intake of FA during pregnancy [18]. This provides the studied women opportunity to receive advices regarding the importance of FA intake during this period of embryogenesis.

In accordance to the relationship between the studied women intake of FA and their knowledge and perception, the present study illustrated that there was a highly statistical significant difference between women's intake of FA and their perception and awareness about folic acid. These results are consistent with Chacko et al., (2003) who studied the knowledge about NTDs and Preconceptional prevention practices in minority young women in Texas and found that adequate folate diet was not associated with knowledge [19]. While Anzaku (2013) in Nigeria reported that women who had knowledge of FA took it at some points during the periconceptional period [20].

With regard to the relationship between women's intake of FA and their knowledge of complications of its deficiency, it is reasonable to assume that those women who took a daily supplement containing FA might not have been doing so for any particular reason related to FA and the prevention of birth defects. As the present study indicated that only 18.6% of women who reported current intake of FA listed NTDs as a main complication, In contrast, these results contradicted the study of Tekkesin &, Taser (2012) who studied FA usage and awareness in pregnant women in Istanbul, Turkey and reported that, women who were aware of the importance of FA were 1.6 times more likely to take periconceptional FA than women who were unaware of it[21].

X. Conclusion And Recommendation

- **Conclusion**

Based on the findings of the present study, it can be concluded that there is a lack of effective public awareness program regarding the importance of periconceptional administration of FA to reduce risk of NTDs. This need to become common knowledge within the general community.

- **Recommendation**

According to the research results, the following recommendations are deduced:

1. Establishment of nutrition curricula for physicians and dieticians.
2. Implementing a continuing educational program for women, including counseling skills about the importance of FA before and during pregnancy.
3. Raise the public awareness of national efforts for fortifications and identifying barriers of less consumption of fortified foods.

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