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Research Article

Perceptions of Folic Acid Knowledge and Intake among Women in the Childbearing Age in Al-Ahssa'a-Saudi Arabia 2018

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Abstract

Background: Neural tube defects are between the most dangerous birth defects through the world. It is well established that the risk of neural tube defects (NTDs) is decreased in women who take folic acid during the peri-conceptional period.

Aim: This study aimed to assess the awareness of childbearing women about the importance of folic acid in preventing neural tube defects in AL-Ahssa'a, the eastern region of Saudi Arabia

Study Design: This was a cross-sectional survey conducted in maternity and children hospital Al-Ahssa'a outpatient clinic. A sample of 380 married women in the childbearing age (18 - 50 years) in AL-Ahssa'a in the period between September - October 2018 participated in a survey study concerning awareness and use of folic acid before and during pregnancy.

Methods: Self-administration questionnaire was carried out by the selected subjects for measuring folic acid awareness. Questions enclosed knowledge and use of folic acid supplements and demographic and socioeconomic characteristics.

Result: Out of 380 women, 362 (95.3%) were Saudis; most of the participants were from young age of 18-25 (40.5%). About 356 (93.7%) have heard about folic acid, but only 278 (73.2%) reported take folic acid in previous pregnancy. Only 62 (16.3%) of participants took folic acid before conception and during pregnancy. Around 154 (40%) of them said that it could Prevent neural tube defects (NTD). A significant relationships between the educational level of women and their knowledge about folic acid was observed (P <. 010).

Conclusion: Regardless to that high rate of women know about folic acid in general the role of folic acid in preventing neural tube defects was deficit. For this reason, healthcare provider must take place to educate women to increase taking folic acid more than it is now.

Keywords: *Folic Acid; Neural Tube Defect; Pregnancy and Reproductive Age Women*

Introduction

Neural tube defects (NTDs) are collections of congenital abnormalities affecting the central nervous system which occur due to failure of the neural tube to close during embryogenesis. It happens within the first 28 days after conception before discovering that women are pregnant. It estimated that 300,000 infant born with neural tube defect every year [1]. Mainly, neural tube defects are classified into two classical subtypes. Brain structure defects including anencephaly and encephalocele. Defects affecting the spinal cord like meningocele and spina bifida [2]. Neural tube defects tend to have multifactorial causes. Genetic predisposition such as simple gene mutation and abnormalities in chromosomes found to have role in neural tube defects development [3]. While in environmental factor, like maternal nutritional status, age, race and obesity play a significant role in neural tube defects development [4], also some medication like epilepsy medications such as carbamazepine has been linked with an increased risk of spina bifida [5]. Mother with certain disease like diabetes mellitus and obesity showed a significant increased risk of NTDs [6].

Proper nutrition for women of childbearing age is essential factor that help to have healthy children and reduce congenital diseases in newborn. Folic acid is one of the most important elements that a woman who think about pregnancy should take it. It was well established that Folic acid supplementation before conception and during the first trimester of pregnancy has shown to be effective in reducing risk of neural tube defects [7,8]. Several studies have revealed relations between neural tube defects and insufficient maternal intake of folic acid before or during pregnancy and that folic acid supplementation could reduce neural tube defects [9,10]. For that reason Various countries international practice compulsory fortification of cereal grain products with FA, as a public health policy like in US, Canada and some of European countries maintain a voluntary fortification of different food product [11]. In early 90s, the United States Public Health Service had recommended taking folic acid supplements in dose of 400 μg on a daily basis for 3 months before conception until the 12 week of gestation for all women who planning to become pregnant [12,13].

Maternal perception about the importance of folic acid in preventing congenital malformation including NTDs plays an essential role in decreasing numbers of birth with these disorders. Limited studies were directed to evaluate the awareness of folic acid benefits among Arabic women of reproductive age. A study done in Lebanon revealed that around 60% of women had heard about folic acid and about 14% knew about folic acid importance to prevent neural tube defects [14]. Other study conducted in Sudan showed that about 80% of the women had heard about folic acid, but only 8.9% knew that folic acid prevents birth defects [15]. Between the period of 1997 - 2000 the incident of NTD was 1.9/1000 live birth which decreased in 2000 - 2005 to 0.76/1000 after the Saudi flour fortification program in 2001 this was reported in research conducted in western region of Saudi Arabia [16]. Studies from Saudi Arabia and Qatar revealed that a high percentage of women were not aware of the importance of FA in preventing NTDs. The intake of FA in the periconceptional period was also low [17,18].

No studies were carried out to explore the level of awareness of FA supplementation benefits among women in the childbearing age in AL-Ahssa, Saudi Arabia (SA), for this reason this study was conducted to assess the level of knowledge among Al-Ahssa women about the important of taking folic acid in the peri-conceptional period.

Methodology

Study design

This was a cross-sectional study conducted in AL-Ahssa, Saudi Arabia, over a two months period, between September and October 2018.

Study setting

The study took place at maternity and children hospital outpatient clinics

Study sample

A simple random sample of 380 participants was involved in the study. The power and sample size was calculated assuming 50% prevalence of awareness, based on a 95% confidence interval and a 5% Margin of error.

Inclusion criteria

Married women who attend maternity and children hospital outpatient clinic between ages of 18-50 years old during the study period were consecutively invited to participate.

Exclusion criteria

Unmarried women, women who did not attend maternity and children hospital outpatient clinic and women under age of 18 or more than 50 years were excluded.

Data collection

Data were collected using a semi-structured questionnaire administered to each woman. It compromise of 22 questions included three main components; Socio-demographic [including marital status, nationality, residency, education level and work status], obstetrical

history [including number of children, history of abortion and if has child with neural tube defects]and Knowledge about folic acid intake[including using of multivitamin, heard about or used folic acid, perception about folic acid benefits for the mother and fetus, recommended dose, natural sources of folic acid and source of their information].

Data analysis

Statistical analysis was carried out using Statistical Package for Social Sciences (SPSS) version 20. Categorical data was expressed as frequency and percentages and numerical data was expressed as means and standard deviation (minimum and maximum). Applicable outcomes were untaken with their 95% confidence intervals (95% CI).

Chi square test was used to analyze the differences between categorical variables were done to examine the association of awareness about and intake of folic acid with selected socio-demographic and obstetric characteristics. A P-value of < 0.05 was considered significant.

Ethical considerations

The research protocol was approved by the king Faisal university, college of medicine Research Ethics Committee. Before completing the questionnaire written informed consent was obtained from the participants. Patient confidentiality issues and right for refusal was considered as reason for not participate in this study.

Results

380 participants agreed to be involved in this study. The socio-demographic characteristics are summarized in table 1. 362 (95.3%) were Saudis; most of the participants were from the group age of 18 – 25 (40.5%), 26-30 (32.1%), 31 - 40 (25.3%) and 41 - 50 (2.1%). The majority of women 212 (55.8%) lived in urban areas.

		N	%
Nationality	Saudi	362	95.3%
	Non-Saudi	18	4.7%
Residency	Urban	212	55.8%
	Rural	168	44.2%
Age	18 - 25	154	40.5%
	26 - 30	122	32.1%
	31 - 40	96	25.3%
	41 - 50	8	2.1%
Education	Primary	22	5.8%
	Intermediate	16	4.2%
	Secondary	116	30.5%
	University	218	57.4%
	Higher education	8	2.1%
Job	Housewife	235	61.8%
	Student	91	23.9%
	Employee	54	14.2%
Family monthly income	Less than 5000	142	37.4%
	5000 - 10000	172	45.3%
	More than 10000	66	17.4%

Table 1: *Socio-demographical.*

About 218 (57.4%) of the participants had university degree and 116 (30.5%) had finished secondary school. 235 (61.85) of the participants were housewives, while only 54 (14.2%) were working. Most of them 172 (45.3%) have an average monthly income of 5000-10000 SR.

Table 2 shows the obstetric history of the participant, the mean number of children of the subjects was 2.0184 (SD ± 1.95). (28.9%) of them had no children, (35.5%) had one or two children, (23.2%) had three or four children, and only (12.4%) had five children or more. About 118 (31.1%) of the women has positive history of abortion with mean of 1.816 ± 1.72. (68.9%) of participants denied any previous miscarriages, (26.8%) of them had only one to two miscarriage, and (4.4%) had three miscarriages or more. 376 (99.5%) report no history of child with neural tube defects.

		N	%
Number of children	No children	110	28.9%
	1 - 2	135	35.5%
	3 - 4	88	23.2%
	5 and more	47	12.4%
History of abortion	Yes	118	31.1%
	No	262	68.9%
NO of abortion	No abortion	261	68.7%
	1 - 2	102	26.8%
	3 and more	17	4.4 %
History of NTD	Yes	2	0.5%
	No	376	99.5%

Table 2: *Obstetric history.*

Table 3 shows the participants awareness and intake of folic acid. About 356 (93.7%) have heard about folic acid, but only 278 (73.2%) reported take folic acid ever. Out of 380 women participate in the study, only 146 (38.4%) were taking vitamins supplements. About 160 (42.1%) had took folic acid supplements after found out they were pregnant, just 62 (16.3) had took folic acid before conception and during pregnancy.

		n	%
Have ever heard about folic acid	Yes	356	93.7%
	No	24	6.3%
Have you ever take folic acid	Yes	278	73.2%
	No	102	26.8%
Do you take multivitamin recently	Yes	146	38.4%
	No	234	61.6%
Period of folic acid intake	Before pregnancy only	36	9.5%
	Before and during pregnancy	62	16.3%
	During pregnancy	160	42.1%
	Do not remember	28	7.4%
	Did not take	94	24.7%

Table 3: *Folic acid awareness and intake.*

Table 4 shows the subject knowledge about the benefits folic acid. Out of 120 (32.1%) knew about the recommended period of taking folic acid for women how want to get pregnant which is before pregnancy and in the first trimester. Only 57 (15%) knew about the recommended dose 400 mcg/day.

		N	%
Recommended period of taking folic acid	First 3 months of pregnancy	122	32.1%
	Before pregnancy and the first 3 month of pregnancy	120	31.6%
	Before pregnancy only	30	7.9%
	Throughout pregnancy	108	28.4%
Recommended dose of folic acid supplement	400 mcg/day	57	15%
	1 mg/day	185	48.7%
	5mg/day	138	36.3%
Benefit of folic acid during pregnancy	Prevent neural tube defect	154	40%
	Prevent miscarriage	39	10.3%
	Contribution to an easy delivery	22	5.8%
	Nutritional supplement for fetus and mother	66	17.4%
	Contribution to the fetus healthy growth	44	11.6%
	Treating anemia	44	11.6%
	Treating reflux/stomach problems	4	1.1%
	No effects stated at all	8	2.1%
Food rich in folic acid	Green vegetables and fruits	151	39.7%
	Cereals	104	27.4%
	Meat	49	12.9%
	Dietary product	46	12.1%
	Rice and corns	30	7.9%
Source of information about folic acid	Doctor	199	52.4%
	Pharmacist	8	2.1%
	Family member	66	17.4%
	Television\social media	107	28.2%

Table 4: *Folic acid knowledge.*

Around 154 (40%) of them said that it could Prevent congenital and neurological malformation (NTD). In addition, 151 (39.7%) of the women were aware that green leafy vegetables and fruits were rich in folic acid. The most common source of information about folic acid was doctors 199 (52.4%) after that comes television/social media in about 107 (28.2%).

The relationship between the sociodemographic characteristics of the women and their awareness and intake about folic acid was reported in table 5.

		Ever heard of folic acid	P- value	Folic acid intake in periconceptional period	P - value
Total		**356**		**(62)**	
Age	18 - 25	39.9%	.192	29%	.000
	26 - 30	31.5%		32.3%	
	31 - 40	26.4%		32.3%	
	41 - 50	2.2%		6.5%	
Residency	Urban	56.7%	.150	64.5%	.123
	Rural	43.3%		35.5%	

Educational level	Primary	5.1%	.010	0%	.002
	Intermediate	3.4%		6.5%	
	Secondary	30.3%		35.5%	
	University	59.0%		58.1%	
	Higher education	2.2%		0.0%	
Work	Housewives	62.6%	.003	77.4%	.000
	Student	22.2%		3.2%	
	Employee	15.2%		19.4%	
Family income	Less than 5000	35.4%	.009	29%	.000
	5000 - 10000	46.6%		51.6%	
	More than 10000	18%		19.4%	
Number of children	No children	27%	.012	6.5%	.000
	1 - 2	36.8%		41.9%	
	3 - 4	23.6%		35.5%	
	5 and more	12.6%		16.1%	

Table 5

A significant relationships between the educational level of women and their knowledge about folic acid were seen in about (P <. 010). Occupational status (p = 003), family monthly income (p = .009) and number of children (p = .012) were significantly related to women's general awareness of folic acid. Age (p = .192) and residential status (p = .150) did not show any significant relationships with folic acid awareness. Between the women how were aware of folic acid young age were more aware in about 39.9%. Women who had university degree were more aware about folic acid (59%) and most of them were house wives (62.6%). Women with average monthly income of 5000 - 10000 SR had the higher percentage of awareness (46.6%). Newly mothers with average number of 1 - 2 children had higher percentage of awareness (36.8%). About folic use in periconceptional period only 62 women confirmed that they took in that time. Same percentage of folic acid intake was in age group (26 - 30, 31 - 40) with 32.3 percent. University graduated had the highest percentage of folic acid intake in peri-conceptional period in about (58.1%). Women who were housewives (77.4%), family income of 5000 - 10000 SR (51.6%) and with average number of children 1 - 2 (41.9%) more knowledgeable about folic intake period. There was significant relationships between folic acid intake and age (p < .000), educational level (p < .002), work (p < 000), family income (p <. 000) and NO of children (p <. 000). But there wasn't relationship between residency and folic acid intake.

Discussion

Folic acid supplements intake during pregnancy has been related to decrease risk of having baby with neural tube defects. For that purpose women who is planning to get pregnant advised to consume folic acid 400 mcg daily before conception and in the 1st trimester of pregnancy. Our aim of this study is to evaluate folic acid awareness and intake among women of reproductive age in AL-Ahssa, Saudi Arabia.

In this study the proportion of general awareness about folic acid was high in around (93.7%), this is because the majority had high education with more than half of participant had university education. The awareness level was higher than other studies done in Texas USA (78%) [19], Thailand (76%) [20], Korea (67%) [21], Nepal (40%) [22] and china (36%) [23]. But has similar result such as study done in Vancouver, Canada report that 95% of the participant knew about folic acid [24]. Comparing to Middle East and Arab countries, the folic acid awareness was higher than reports from turkey (46%) [25], Lebanon (60%) [15], Egypt (62%) [13] and Sudan (80%) [16].

A literature of postpartum women from UAE showed 46.4% of the respondents reported hearing about folic acid [10]. Another study conducted in Qatar [18] showed that 53.7% has heard about folic acid. Between researches done in Saudi Arabia, our study has higher proportion of folic acid awareness rather than Jeddah (91%), Riyadh (58%), almadinah (88.6%) and hail (91%) [26-29].

Regardless of that (73.2%) high percentage of participant took folic acid supplements in their previous pregnancies only 16% reported taking it in the recommended time (before pregnancy and 1st trimester. This is related to that some pregnancies are not planned or women who planned to get pregnant did not involve in prenatal consultation and because women only visit the doctor after they knew they are pregnant the majority of them were taking folic after they found they were pregnant (42.1%). Only 31.6% of the women knew about the critical time of taking folic acid supplements to prevent NTDs. This was higher than other reports from USA, Qatar UAE, Sudan and Egypt. But similar to almadinah which was 74% of their subjects confirmed taking folic acid in previous pregnancy.

It is well recognized that folic acid supplements could reduce the risk of neural tube defect occurrences and recurrences since Hibberd and his partners discover it in 1960 [30]. The women awareness about the preventive role of folic acid in this study was (40%). It shows the misconception about the folic acid benefits between women in reproductive age.

These results were close to Egypt (39.2%) and less than Hail which reported that 81% of their participants knew that folic acid could prevent neural tube defects. It was higher than reports from Riyadh, Canada, Thailand and Korea.

The relationship between folic acid awareness and intake and sociodemographic characteristics demonstrate that Between the 356 women who were aware about folic acid the youngest age of 18 - 25 has the higher percentage in 39.9% and lowest between 41 - 50 (2.2%) and 56.7% of them were living in urban areas but this did not show any significant differences with the level of awareness. This is opposite to Sudan which found that there was a significant difference between folic acid awareness and living in urban area.

(59%) of current subject who aware about folic acid were university educated with positive significant differences ($p < .010$) this suggested there is relationship between level of education and awareness of folic acid. Resampling result from Working status and number of children were significantly correlated to women's awareness of folic acid ($p = .003$, $p = .012$) which is similar to Egyptian study. In this study woman with 1 - 2 child showed higher awareness about folic acid rather than women with higher number of children this oppose to Lebanese study which mention that Higher awareness was associated with higher number of children.

Taking folic acid in the appropriate time was significantly associated with all sociodemographic data [age, working status, number of children, family income (.000), and educational level (.002)] except residency ($p = .123$) same as reports from Jeddah and hail.

The source of knowledge about folic acid was mainly from physician this put huge responsibilities on health care providers to inform women the correct information about folic acid and should encourage women to perform preconception counseling to make sure they use folic acid as recommended.

Conclusion

Despite that high percentage of women in this study had a general idea about folic acid; there is a large misconception about the right period for folic acid supplementation and its value in preventing neural tube diseases. This builds a gap between knowing the information and applies it in the other hand.

Recommendation

- Taking advantage from television and social media to make doctors talk about folic acid to promote the awareness about folic acid in reproductive age women.
- Awareness campaigns should be done targeting wide range of the population.
- This study did not represent the whole women because it was targeting only married women and carried on the women who visited maternity and children hospital outpatient clinics, so further study should take wide range of population in different places. And differentiation between level of awareness between married and unmarried women could be done.

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