

Awareness and Knowledge Regarding Periconceptional Folic Acid Intake Among Female Patients at Iskan Primary Health Center, Makkah Al- Mokarramah Kingdom of Saudi Arabia

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ABSTRACT

Background: Periconceptional folic acid supplementation has been recommended over decades for prevention of neural tube defects. The awareness and knowledge regarding this recommendation seems, however, to be unsatisfactory.

Objectives: The aim of the current study was to evaluate awareness and knowledge of Periconceptional folic acid supplementation among childbearing age females attending Iskan primary health center, Makkah, Kingdom of Saudi Arabia.

Methods: A cross-sectional study was carried out between November 1st to December 31st, 2014 included a representative sample of women attending the out-patient clinics of Iskan primary health care center. They were subjected to an interview questionnaire, which included socio-demographic data as well as multiple choice questions regarding the awareness and knowledge about folic acid.

Results: The study included 494 women. Their age ranged between 18 and 49 years with a mean \pm SD of 29.9 \pm 7.9 years. Of them, 439 (88.9%) have ever heard about folic acid, while 55 (11.1%) have never heard about it. 40.5% of the women had insufficient knowledge regarding folic acid. Higher educated women, those having information from physicians, journals or internet, and those having history of ever pregnancy were more likely to have sufficient information regarding folic acid.

Conclusion: Awareness and knowledge about folic acid and the benefit of its supplementation during pregnancy among women seems to be rather satisfactory. The awareness and knowledge need, however, to be raised, in general, and regarding the timing of administration during pregnancy, in particular.

Keywords: Awareness, Knowledge, Folic Acid, Periconceptional.

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INTRODUCTION

Approximately 5-7% of newborns present with a birth defect; a fact which makes human birth defects as a major public health burden. Human birth defects affecting the formation of the neural tube, the precursor to the central nervous system, are one of the most common and debilitating human birth defects.¹

The current evidence derived from several studies over decades as well as systematic reviews and meta-analyses proves a 50-70% protective effect of adequate consumption of folates in prevention of neural tube defects.²⁻⁶ The percentage of NTDs sensitive to folate deficiency has been estimated globally to be 75%.⁷ In Saudi Arabia, a total of 643 patients were registered in the Neural Tube Defects Registry, and mothers of the patients were asked about use of folic acid. In the registry sample only 7 (1%) of the mothers took folic acid in preconception period, whereas 6 (1%) had it off/on, as compared to 588 (98%) who never had folic acid in their preconception period out of total 601

cases. Regarding the folic acid intake during first trimester situation is little bit better with 22 (4%) had folic acid, while 95 (16%) had folic acid intake off/on. 471 (80%) cases never had it even in the first trimester out of the total of 58 cases.⁸

Both nutritional folate and folate supplementation are needed for optimal benefit. Current nutrition is frequently deficient in the high folic acid requirements during pregnancy. On the other hand, a great proportion of pregnancies are unplanned. Therefore, to ensure normal fetal development, optimal nutritional status should be maintained throughout the reproductive years.⁹⁻¹⁰

Women's awareness of the need for periconceptional folic acid supplements, and compliance with recommendations, has not been well studied in developed and developing countries. To our knowledge, one study only has been conducted among Saudi women on awareness and intake of additional folic acid among women of child-bearing age and the awareness was 12%.¹¹

Awareness of folic acid in Qatar was 53.7%, although only 20.3% reported intake of folic acid.¹² In the United Arab Emirates 79.1% of women had heard about folic acid, 29.5% of the women in the study reported that the proper time for folate supplementation should be before pregnancy.¹³ Prevalence of intake of preconceptional folic acid in Lebanon was found to be 14 %.¹⁴

There is always a continuous and compelling need to explore about awareness and knowledge of folic acid supplementation and its role in prevention of neural tube defects.

SUBJECTS AND METHODS

The current study is a cross-sectional study conducted at Iskan primary health center, Makkah, Kingdom of Saudi Arabia, during the period between November 1st and December 31, 2014. It included women at the child bearing age, attending at the outpatient clinics. Systematic random sampling technique was adopted to recruit women. A sampling frame for all women attended the outpatient clinics was prepared and every third woman attending at the clinic during the study duration was invited to participate in the study.

Sample size was calculated using Roasoft sample size calculator, setting the confidence level at 99%, the confidence limit at 5% and the expected sufficient knowledge regarding folic acid as 50%. Calculation according to these values produced a minimal sample size of 499 women.

Data was collected through a self-administered Arabic questionnaire. It is self-created through literature review of similar studies conducted in Saudi Arabia. It consisted of 2 sections; section 1 collected socio-demographic data of the participant and section 2 consisted of multiple choice questions concerning awareness and knowledge about folic acid. Awareness of folic acid was assessed by ever-heard about folic acid. Knowledge about folic acid was assessed by 7 questions; folic acid deficiency may harm the fetus, regular folic acid intake may prevent congenital malformation, and the correct timing is preconception and during 1st trimester of pregnancy.

A score of “1” was given to correct answers while a score of “0” was given to wrong and don’t know answers. The total score was computed in the way that higher score indicated better knowledge. The median value of the knowledge score was computed. Participated women who had less than the median

value of knowledge score “4” were considered as having “insufficient knowledge” whereas those who had median or more knowledge score were considered as having “sufficient knowledge”. Additional data were collected about previous use and timing of folic intake in women who ever got pregnant and about source of information.

Structured questionnaire was subjected to face validity by being reviewed by two consultants in family medicine, in addition to the supervisor who is a consultant in family medicine and it was validated after its modification according to their notices. Before proceeding in the survey, a pilot study was carried out on 20 women to assess the feasibility of the study and wording of the questionnaire. The questionnaire was clear, understandable and suitable, the questionnaire was accordingly modified and data obtained from this pilot study was excluded from statistical analysis. In addition reliability and internal consistency the questionnaire was assured by retesting it after 2 weeks. A Cronbach’s alpha test value of 0.63 as well as an average coefficient of correlation of 0.92 has been obtained, indicated that the created questionnaire is reliable and internally consistent.

Written permissions from Makkah joint program of family medicine and the director of Iskan primary health care center were obtained. In addition, a verbal consent was taken from each participant.

Data were entered to a personal computer and were analyzed by using Statistical Package for the Social sciences (SPSS) program version 20. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as arithmetic mean, median, standard deviation (SD) and interquartile range. Chi square test was utilized to evaluate the association between knowledge of folic acid and other categorical variables. Student’s t-test was applies to test for the difference in means of continuous variables between two groups. Multiple associations were evaluated in multiple logistic regression models based on the backward stepwise selection. This process allowed the estimation of the strength of the association between each independent variable and the dependent variable taking into account the potential confounding effects of the other independent variables. An adjusted odds ratio with 95% CI that did not include 1.0 was considered significant. P-value of less than 0.05 was considered as a level for significance throughout the study.

Table 1: Socio-demographic characteristics of the participants.

Age (mean±SD)	29.9 ± 7.9
Number of children (medial (IQR))	2 (0 – 4)
Number of siblings (medial (IQR))	7 (5 – 9)
Marital status	
Married (N (%))	400 (81%)
Single (N (%))	72 (14.6%)
Divorced (N (%))	13 (2.6%)
Widowed (N (%))	9 (1.8%)
Pregnancy status	
Ever pregnant (N (%))	367 (74.3%)
Never (N (%))	127 (25.7%)
Education	
Illiterate (N (%))	1 (0.2%)
Primary (N (%))	16 (3.2%)
Preparatory (N (%))	75 (15.2%)
Secondary (N (%))	200 (40.5%)
University (N (%))	199 (40.3%)
Postgraduate (N (%))	3 (0.6%)

**Table 2: Determinants for sufficient knowledge regarding folic acid among participants:
Multivariate logistic regression analysis**

Variables	B	SE	p-value	AOR	95% CI
Educational level					
Illiterate/primary (n=17) ^a				1.0	---
Intermediate (n=75)	0.630	0.611	0.302	1.88	0.57-6.22
Secondary (n=200)	0.124	0.579	0.830	1.13	0.36-3.52
University+ (n=202)	1.407	0.585	0.016	4.08	1.30-12.85
Physician					
Yes (n=312) ^a				1.0	---
No (182)	-1.617	0.234	0.000	0.20	0.13-0.31
Journals					
Yes (n=61) ^a				1.0	---
No (n=433)	-1.027	0.394	0.009	0.36	0.17-0.78
Internet					
Yes (n=139) ^a				1.0	---
No (n=355)	-0.961	0.261	0.000	0.38	0.23-0.64
History of ever pregnancy					
No (n=127) ^a				1.0	---
Yes (n=367)	0.803	0.253	0.001	2.23	1.36-3.67

^a: Reference category; CI: confidence interval; AOR: Adjusted odds ratio; B: Slope; SE: standard error

Variables of age, marital status, social media, and number of sources of information were removed from the final logistic regression model (not significant)

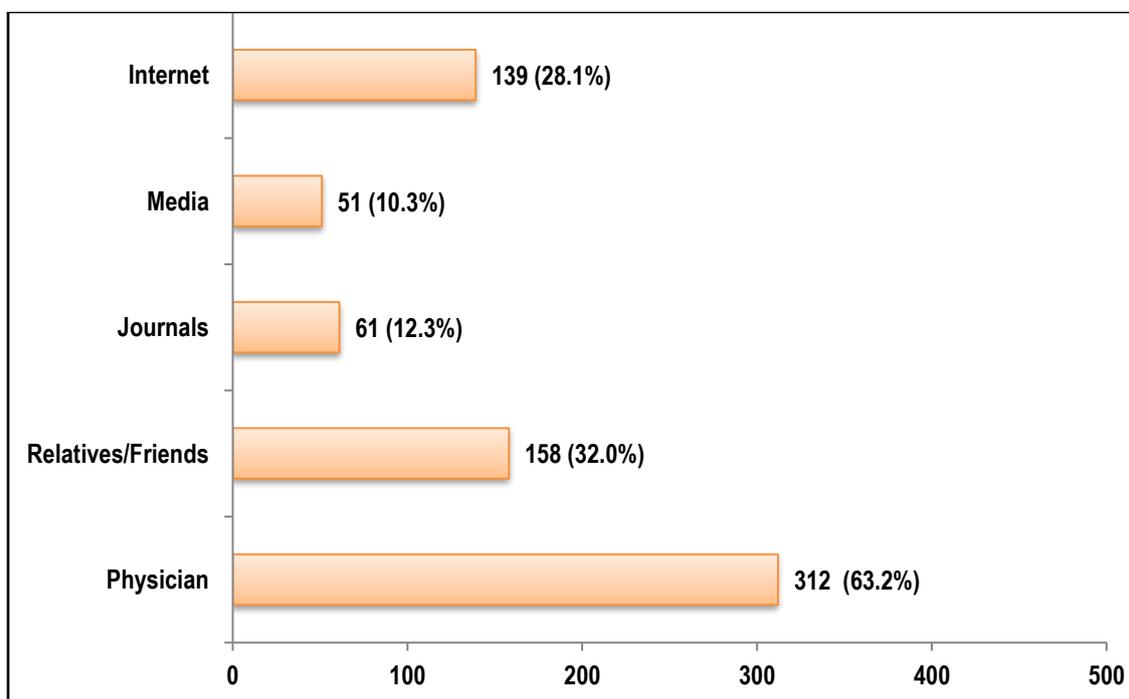


Figure 1: Source of Information regarding Folic acid administration among the participants.

RESULTS

The study included 494 women out of 499 invited for the study giving a response rate of 99%. Table 1 shows their socio-demographic characteristics. Their age ranged between 18 and 49 years with a mean±SD of 29.9±7.9 years. Majority of them (81%) were currently married. The median of the number of children was two with interquartile range of 0 to 4 children while the median of their number of siblings was 7 with an interquartile range of 5 to 9 persons. Most of them (74.3%) were ever pregnant. Regarding their educational level, majority of them (81.4%) were at least secondary school graduated,

Of the included 494 women, 439 (88.9%) have ever heard about folic acid, while 55 (11.1%) have never heard about it. Of them, 352 (71.3%) claimed they know about the benefit of folic acid, 144 (29.1%) knew that folic acid deficiency causes harm to adults, 296 (59.9%) knew that folic acid deficiency causes harm to fetuses whereas 386 (78.1%) knew that folic acid administration prevents malformations. Also 112 (22.7%) knew that folic acid is recommended to be regularly taken in adults, 395 (80%) knew it is recommended to be taken in pregnancy. Of the latter 395 women, 259 (52.4%) knew it should be given both preconceptionally and

prenatally. In addition, 367 (74.3%) got pregnant at least once; of them 312 (85%) have taken folic acid. The timing of folic acid administration was only preconceptional in 19 (6.1%), only prenatal in 105 (33.7%) women, and both preconceptional and prenatal in 188 (60.3%) women.

Figure-1 shows the various sources of information regarding folic acid administration among the studied group of women. The most prevalent source of information was through physicians [312 (63.2%)], followed by relatives/friends [158 (32.0%)] and the internet [139 (28.1%)]. Overall, 40.5% of the women had insufficient knowledge regarding folic acid.

In the multivariate analysis, women with at least university graduation were almost four-folded more likely to have sufficient knowledge regarding folic acid as opposed to illiterate or having primary school education (adjusted OR= 4.08, 95%CI= 2.66-7.25). Regarding source of information, women who had no information from physicians were 80% less likely to have sufficient knowledge compared with those having information from physicians (adjusted OR= 0.20, 95%CI= 0.13-0.31), those who had no information from journals were 64% less likely to have sufficient knowledge compared with those having information from journals (adjusted OR= 0.36, 95%CI= 0.17-0.78) while women who had no information from internet were 62% less likely to have sufficient knowledge compared with those having information from internet (adjusted OR= 0.38, 95%CI= 0.23-0.64). Women who had history of ever pregnancy were more likely to have sufficient knowledge regarding folic acid compared to those with no history of pregnancy (adjusted OR= 2.23, 95%CI= 1.36-3.67). However, age, marital status, social media as a source of information, and number of sources of information was removed from the final logistic regression model. (Table 2)

DISCUSSION

Observational and interventional epidemiological studies on neural tube defects (NTDs), have been consistent with a 50 to 70% protective effect of adequate consumption of folates.² The link between fetal NTDs and other congenital malformations and maternal folate status is generally accepted.³⁻⁶ The percentage of NTDs sensitive to folate deficiency has been estimated globally to be 75%.⁷

Educational strategies on the importance of folic acid supplementation among women are particularly important in the Kingdom of Saudi Arabia, as the incidence of NTDs is still high despite the recent fortification of flour.¹⁵

Women may not take folic acid despite having knowledge of its benefits because they are not planning to become pregnant. However, those who might become pregnant (including women using contraception and actively trying not to get pregnant) rather than those planning pregnancy, are the target of recent folic acid campaigns.¹⁰

The current survey showed that knowledge about folic acid in general was rather prevalent (more than 88% of included women stated that they ever heard about folic acid and 59.5% had general sufficient knowledge regarding folic acid and its significance; more than 70% knows about its benefit; more than 59% knows that folic acid deficiency is harmful to the fetus). The knowledge regarding its benefit in adults was, however, quite poor (only 29.1% knows about potential harm of folic acid deficiency in adults).

In a similar study, Al-Holy et al. reported high knowledge level regarding folic acid among Saudi women in Hail (91% of the subjects have heard or read about folic acid and 81% knew that folic acid has a role in preventing NTDs).¹⁶

In another study conducted by Al-Akhfash et al., 88% of the women had heard about folic acid and 53.8% of them were aware that folic acid prevents certain fetal anomalies.¹⁷

In another Canadian study, 95% of included women had ever heard about folic acid, but only 25% knew its role in prevention of birth defects¹⁸ whereas in an Australian study, the level of awareness about folic acid was 62.3%.¹⁹

In Urab world, the knowledge regarding folic acid was also reported to be 46.6% in United Arab Emirates,²⁰ and 60% in Lebanon.²¹

The optimal benefit gained from folic acid administration to prevent NTDs is both preconceptional and during 1st trimester of pregnancy. The current guidelines recommended that all women of childbearing age receive 0.4mg (400 µg) of folic acid daily periconceptionally (1 month before and 2 months after).²² The current study showed that knowledge regarding the need for both preconceptional and prenatal administration of folic acid was rather fair in included women (more than 50% stated they know about it; and more than 60% of women who ever got pregnant took it in such a way).

The quite fair or sometimes substandard awareness regarding the need for preconceptional folic acid intake was shown by several previous studies. Al-Hakeem found that the percentage of women who were aware of the need of pre-pregnancy folic acid supplementation were only 31.5% of responders.²³

In another study, 78% of responders in their study chose correctly the answer of preconception as the best time to take folic acid for prevention of NTDs and 84% got the right answer of the daily dosage.¹¹

A lower level of knowledge was reported by Al-Holy et al., who stated that only 10% of the studied women stated that folic acid should be taken before pregnancy as well as during pregnancy.¹⁶

The current study showed that higher education and previous pregnancy were associated with better knowledge regarding folic acid administration in pregnancy and the timing of administration.

This was in agreement with Al-Akhfash et al. who showed that higher educational level was significantly associated with more awareness regarding preconceptional intake of folic acid.¹⁷ Similarly, Al-Hakeem showed that university education was reported in 32.9% of the studied women and concluded that educational status has positive impact on knowledge of Saudi women.²³

Bener et al. also reported in their study that educated women had better awareness regarding folic acid intake, and used it more often in the periconceptional and first trimester of pregnancy.¹²

Regarding the source of information about folic acid, the current study showed that almost 63% of respondents had their information from physicians, almost 32% from relatives/friends, almost 12% from reading, almost 10% from media and almost 28% from the internet.

The current study also showed that information gained from physicians or journals or internet were associated with better knowledge regarding the need for folic acid administration during pregnancy and the need for both preconceptional and prenatal administration of folic acid.

This was in agreement with a previous similar study, in which the most common information sources were from medical professionals (42.3%), and other sources were from the television, radio, Internet, books, and magazines (34.6%).¹¹ In contrast, the Canadian study reported that the most common sources of information were magazines/newspapers, and television/radio.¹⁸ In a large systematic review, the most commonly reported sources of information on folic acid were the media (including magazines, newspapers, television and radio) and health professionals (e.g., GPs and midwives).¹⁰

Among limitations of the current study; first: it was conducted in one city as well as one primary health care center, which limits the generalizability of study results to all Saudi women. Second: the study used a self-report questionnaire, in which recall bias might be a consideration. However, the current study included a relatively large sample size and tackled an important public health preventable health problem.

In conclusion, awareness about folic acid and the benefit of its supplementation during pregnancy among Saudi women seems to be rather satisfactory. The awareness need, however, to be raised, in general, and regarding the timing of administration during pregnancy, in particular.

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