Research Article (Open access)

The Awareness of Folic Acid Supplements among Women of Child bearing Age in King Abdulaziz University Hospital, Jeddah-Saudi Arabia

Ayman A. Bukhari[1*], Osama S. Bajouh[2], Marwa A. Aljehani[3], Nouf J. Alzahrani[4], Amal M. Al Qahtani[5], Ahmad MS Almrstani[6]

[1]SBOG, ABOG, Assistant Professor, Department of OB/GYN, King Abdulaziz University, Jeddah, Saudi Arabia
[2]SBOG, AFSA, Assistant Professor, Department of OB/GYN, King Abdulaziz University, Jeddah, Saudi Arabia
[3]Medical student, Department of OB/GYN, King Abdulaziz University, Jeddah, Saudi Arabia
[4]Medical student, Department of OB/GYN, King Abdulaziz University, Jeddah, Saudi Arabia
[5]Medical student, Department of OB/GYN, King Abdulaziz University, Jeddah, Saudi Arabia
[6]SBOG, ABOG, Department of OB/GYN, King Abdulaziz University, Jeddah, Saudi Arabia

[*]**Address for Correspondence:** Dr. Ayman A. Bukhari, SBOG, ABOG, Assistant Professor, Department of OB/GYN, King Abdulaziz University, Jeddah, Saudi Arabia

Received: 28 June 2016/Revised: 25 July 2016/Accepted: 28 August 2016

ABSTRACT- This study aimed to assess the awareness of the importance of folic acid in preventing neural tube defects (the timing of folic acid supplementation and the right doses) in Jeddah the western region of Saudi Arabia. A sample of 501 married women in the reproductive age (19-45 years) who visited the outpatients clinics at King Abdulaziz University Hospital between August and October/2015 were asked to participate in a survey study targeting the awareness and the use of folic acid before and during pregnancy. First step was collecting Participants' responds on a range of questions related to socio demographic & medical characteristics. Then in second step they were provided with questions related to their awareness before and after reading the distributed intervention brochure. Of the 501 Participants, 317 (63.3%) were Saudis, many were above 30 years of age (55.1%), 460 (91.8%) heard about folic acid & 429 (85.6%) have taken it. However, only 169 (33.7%) knew that it must be given during preconception and as early as the 1st 12 weeks of gestation. A significant difference was found before and after reading the brochure in Participants' knowledge about the benefits of folic acid in preventing neural tubal defect , the critical time of administration & the right doses (P <0.000, P <0.000, P <0.000) respectively. University education was the strongest predictor to have the right information with significant difference (P <0.000). 279 (71.2%) of the participants reported the medical staff as to be their main source of information. The health care professionals and media need to increase women awareness about the importance of taking folic acid supplementation in the proper time to reduce the risk of neural tube defects.

Key-words- Folic Acid, Preconception awareness, Maternal Vitamins, Neural tube defects, Maternal Supplements

----------IJLSSR----------

INTRODUCTION

Since 1960, a relation was found between the occurrence of neural tube defect (NTDs) & poor folic acid (FA) intake during (preconception & first trimester). This fact was confirmed by many studies (1-3).

Access this article online	
Quick Response Code:	Website: www.ijlssr.com
	crossref DOI: 10.21276/ijlssr.2016.2.5.14

Neural tube defects (NTDs) are one of the most serious congenital anomalies contributing to infant mortality and serious disability, and the second most common type of birth defects after congenital heart defects (4-6). They occur during days 22-28 of fetal development, before most women even know that they are pregnant. So, even if a pregnant lady started taking FA after the first month of pregnancy, the damage had already happen (1,7,8).

According to that, sincerely 1990s the world health organization [WHO] and the center for disease control [CDC] had consequently recommended taking folic acid supplements 400 µg folic acid on a daily basis for 3 months before conception until the twelfth week of gestation for all women planning to become pregnant (7,9,10-12). Additionally If the women had a previous

child with a NTD, the dose should be of 4 mg of folic acid per day (6,9,14). But in spite of all these studies & recommendations, the folic acid intake is still very low in women of childbearing age. several reasons contributed in this low intake: less awareness of the value of folic acid in reducing the risk of neural tube defects (NTDs), about half of the pregnancies being accidental. Women as a result to that might not be protected in the right time. The time between thinking of pregnancy & actual pregnancy is unpredictable putting women at risk of forgetting the daily dose of folic acid supplementation (13,14).

During the last decade, few studies were conducted to assess the awareness of folic acid benefits among Arabic women of Childbearing Age. A Lebanese study showed that only 60% of women had heard of folic acid and only 14% knew about folic acid benefits to prevent NTDs (15). The awareness of folic acid in the study conducted among Qatari women was (53.7%) although, 53.7% of our studied subjects heard of folate & only 20.3% reported their actual intake of folic acid (16). While in the study conducted in Saudi Arabia which showed 91.0% of the subjects were aware of folic acid, 81.0% knew that folic acid could prevent neural tube defects and 84.0% of the subjects took folic acid prior or during a certain stage of pregnancy, this is also similar to the study that was conducted in Almadinah (13,17).

In Kingdom of Saudi Arabia, there were two studies performed among female college students regarding folic acid awareness and three studies among all women of reproductive age in Hail, Almadinah and Al-Qassim regions (13,17). But there is no study has been published about the awareness to take folic acid to prevent NTDs in Jeddah- western region. Therefore, this study aimed to evaluate the awareness, knowledge and behaviors relevant to folic acid intake among women of reproductive age attending the outpatient clinics in King Abdulaziz University Hospital (KAUH), and to assess changes in attitudes and knowledge after the distribution of an interventional brochure.

METHODS

A cross sectional study was conducted from August to October 2015 in KAUH (King Abdulaziz University Hospital, Jeddah, Saudi Arabia). Five hundred women were enrolled in the study according to the following inclusion criteria: 1-Age: 15-45 years old, 2-Came to outpatient clinics in KAUH, 3-Had children, 4-Planned to be pregnant. All the participants signed consent after the interviewers explained the objectives of the study. The study was approved by the research ethics committee in the faculty of medicine, King Abdulaziz University.

QUESTIONNAIRE

In order to be sure that the participants understood both the information in the brochure and the exact meaning of the questionnaire so they can answer the questions clearly and concisely, the authors depended on face to face interview, medical students were trained to present the awareness brochure and interview the participants using a structured questionnaire .The interviews lasted Approximately 5-10 min. The questionnaire covered-

1: Personal data included sociodemographic data (maternal age, educational level, occupation & monthly income), & medical characteristics (gravidity, abortion, congenital anomalies & plans for future pregnancy).

2: General knowledge questions about folic acid supplementation included (the appropriate time of initiating folic acid, the frequency of administration, its beneficial effect in avoiding congenital anomalies especially NTDs, the resources).

3: The participants who read the brochure can then be assessed depending on the changes in their knowledge about folic acid using and benefits during pregnancy by utilizing the same previous questions concerning folic acid supplementation.

STATISTICAL ANALYSIS

The data collected was analyzed using SPSS version 20 statistical software. Parametric data were expressed as mean and standard deviations (minimum and maximum) and non-parametric data were expressed as number (percentage). Comparison between participations' knowledge before & after the brochure used unpaired Macneimer test & Wilcoxon test, Chi-square test was used to find the relation between sociodemographic data & the awareness of folic acid. AP-value of <0.05 was considered significant.

RESULTS

501 participants agreed to be involved in the study. 317 (63.3%) were Saudis, most of the participants were from the group age of more than 30 (55.1%) with a mean score of (31.8±7.1) years of age and ranging between (17-57) years of age. 214 (48.1%) from them had a university degree, 350 (69 %) of the participants were housewives & 394 (78.6%) were from the western region. 378 (75.4%) participants lived in an apartment & 333 (66.4%) had monthly income range of (2000-9999) Saudi Riyals. The mean score of gravidity was (3.1±2.4) with a range of (0-15) (Table 1).

Table 1: Socio demographic data & medical characteristic

Variables		N	%
Age group	(15-20)	18	3.6
	(21-25)	86	17.2
	(26-30)	121	24.2
	(more than 30)	276	55.1
Education level	Illiterate	9	1.8
	Only reading and writing	10	2.0
	Primary	23	4.6
	Intermediate	46	9.2
	Secondary	158	31.5
	University	241	48.1
	Postgraduate	14	2.8
Monthly income	(less than 2000)	89	17.8
	(2000-4999)	180	35.9
	(5000-9999)	153	30.5
	(10000-20000)	63	12.6
	(more than 20000)	16	3.2
Planned pregnancy	Yes	254	50.7
	No	247	49.3

Regarding the medical characteristic of the participants, 279 (55.7%) were pregnant during the distribution of the questionnaire. 465 (92.8%) didn't have any experience with children having congenital anomalies. Of the 36 women who had babies with different types of congenital anomaly, only 5 participants (12.8%) had babies with spinal cord defect lesions. All the participants did not report any family history of spinal cord defects. 258 (51.5%) participants did not have any medical disorders, the rest had different medical problems in the form of 3 participants (0.6%) having epilepsy, 39 (7.8%) were diabetics, 5 (1%) had sickle cell anemia and 37 participants (7.4%) suffered from obesity problems. Concerning the level of awareness about the importance of folic acid among the participants before the distribution of the brochure, 460 (91.8%) heard about it and 429 (85.6%) had actually taken folic acid. There were several reasons behind the lack of folic acid administrations: A few (1.9%) were worried about side effects. 15.2% were never be advised to its importance, (5.7%) didn't like pills and 9 participants (8.6%) reported no particular reasons. Of the participants, 357 (71.7%) reported that they were not taking it know & 252 (50.3%) thought that it is a prescription medication. 366 (73.1%) believed that they need to take it on daily basis & 215 (42.9%) reported that they have never forgot to take it. 267 participants (53.3%) didn't know the exact dose and 228 (45.5%) didn't know the main resources of folic acid (Table 2).

Table 2: Information about Folic acid

Variables		N	%
Have you heard ever of folic acid	Yes	460	91.8
	No	41	8.2
Have you ever taken a folic acid supplement	Yes	429	85.6
	No	72	14.4
The period that I was taken folic acid	Not applicable	72	14.4
	Before I found out about my pregnancy	70	14.0
	After I found out about my pregnancy	344	68.7

	I don't remember	15	3.0
Is the folic acid supplement a prescription product or a nonprescription	Prescription product	252	50.3
	Over the counter product	150	29.9
	I do not Know	99	19.8
How frequently are you supposed to take your folic acid supplement?	Everyday	366	73.1
	2-6 times in a week	16	3.2
	Once in a week	6	1.2
	I don't know	113	22.6
In an average week, how many times have you forgotten or have you chosen not to take your folic acid tablet?	Not applicable	78	15.6
	Never	215	42.9
	1-3 days out of 7	118	23.6
	4-6 days out of 7	14	2.8
	Everyday	76	15.2

193 (56.9%) reported prior knowledge of the fact that folic acid prevents neural tubal defect. 188 (37.5%) thought it must be taken during 1st trimester & 169 (33.7%) during preconception as early as first 12 weeks. 391 (78%) received advice to take it during pregnancy. 279(71.2%) received this advice from medical staff. After the distribution of the innovation awareness brochure, 265(53.2%) said that the dose is less than 1mg, 432 (86.2%) said it Prevent neural tubal defects, also 274(54.7%) learned the knowing of the main resources of it, 324(64.7%) said it is cereals, 452 (91.2%) said vegetables & 365 (72.9%) said fruits. When comparing the participants' information about folic acid before and after reading the brochure there was significant difference in the knowledge of the benefits of folic acid in preventing neural tubal defect (P<0.000), the patients who reported not knowing the benefits become less (decreased from 82 -24.2% to 36-7.2%) with significant difference (P<0.000).The majority of the participants became more educated about folic acid resources (91.2% vegetables & 72.9%) (P<0.000). Likewise concerning of doses & the perfect time to take folic acid supplements, the facts became more valid. The number of participants who reported (I don't know) about the right doses decreased from 267 (53.3%) to 39 (7.8%) after reading the brochure with significant difference (P<0.000). Regarding the (Imp period) item, the number of (I don't know) response decreased from 84 (16.8%) to 9 (1.8%) with significant difference (P<0.000) (Fig. 1-3).

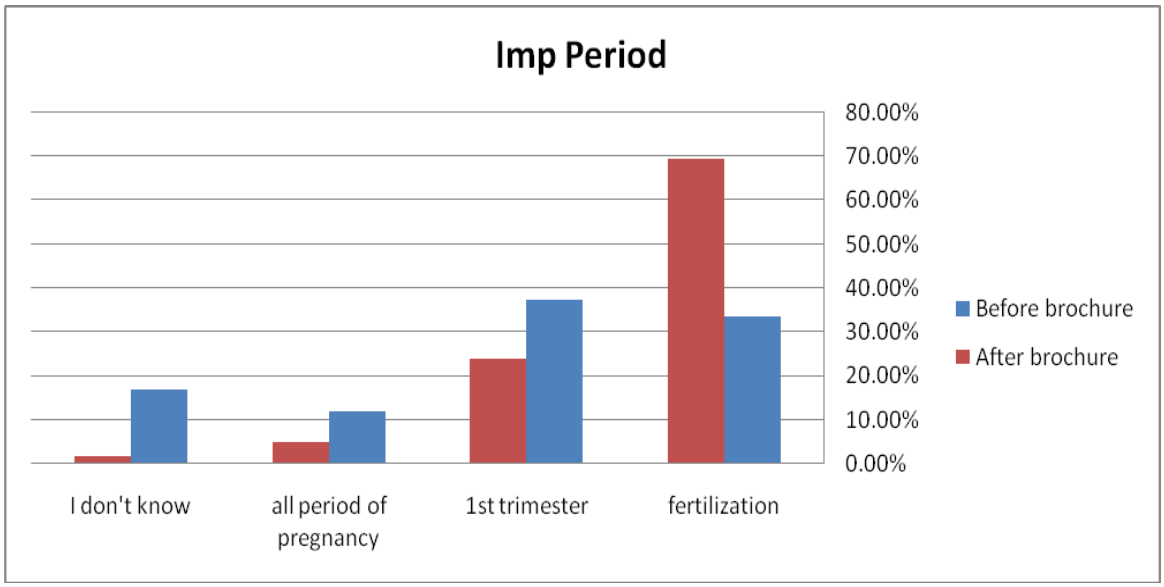

Fig. 1: Comparison between information before & after the brochure about Imp Period

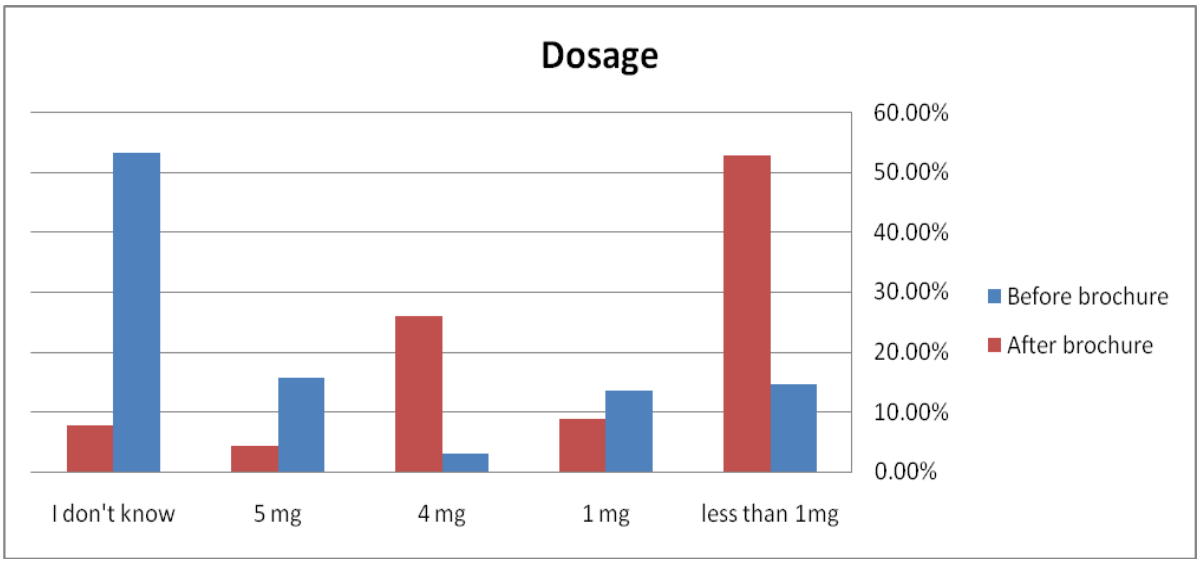

Fig. 2: Comparison between information before & after the brochure about dose

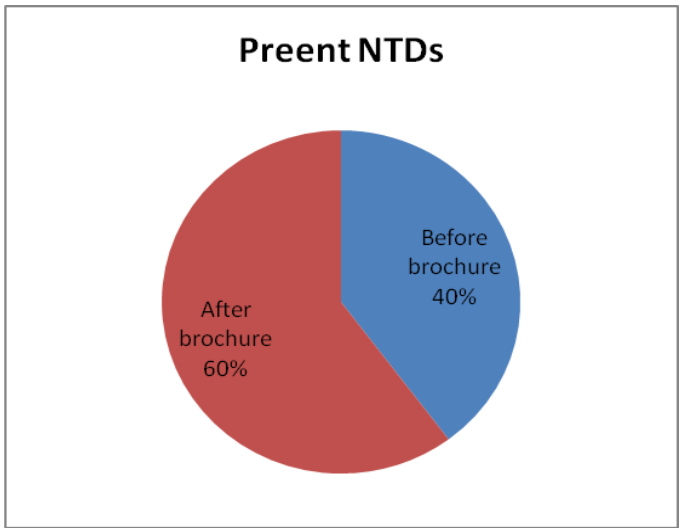

Fig. 3: Comparison between information before & after the brochure about preventing NTDs

On the other hand there was a significant difference between nationalities with a positive correlation to Saudis when contrasted with non-Saudi (P<0.000). Likewise a significant difference was demonstrated when comparing different levels of education and occupational status (the superior level of awareness was for university level with P<0.000 & medical employee with P=0.05). Furthermore participants who lived in apartments (337-89.2%) had high awareness to folic acid supplementation (P<0.000). This significance is similarly observed for the participants who had a monthly income in the range of 2000-9999 demonstrating a high percentage (85.6% & 92.2%) of awareness with P<0.000.

DISCUSSION

A lot of studies were conducted on the folic acid awareness in different countries, areas & populations, especially those targeting the dosage & critical timing of administration.

Several studies focused on the awareness rates, such as folic acid preventing NTDs, or folic acid supplementation before pregnancy. These rates appear high in many of the countries studied. About 95% of respondents in Canada during 2003 were aware of folic acid. Nearly 77% of women in Australia had heard of folic acid and about 84% of women in the USA knew about it (17). 46.3% of women in Turki had awareness of FA (18) while in Egypt the awareness rate among pregnant women was 62.4% (7), Qatar (53.7%), United Arab Emirates (46.6%) (19), and about 60% of Lebanese women had heard about it (20).

The results of the study showed that 460 (91.8%) heard about FA & 50.7% of them were planning for pregnancy, 429 (85.6%) had taken FA supplements but only 14% took it before becoming pregnant and this was similar to the studies conducted in Turkey (12.2%) (18), Qatar (20.3%) & in Lebanon (7.5%). Also, in a European survey, while 70% of the respondents indicated that they had heard of folic acid, only 40% took it (5,16). This indicated that although there is an increasing in the general awareness among married women in the reproductive age about FA, still there is a gap between knowing & acting which needs to be improved. This gap may be due to difficulty of recalling information from previous pregnancies or, for reasons related to social bias, women find it difficult to admit their lack of awareness to FA benefits (10).

There was significant difference (P<0.000) between the level of education & the awareness of FA supplements. The participants with university degree were more aware of FA benefits than the participants with lower educational levels. Likewise the level of education among women in Hail-Saudi Arabia was also a powerful index of FA intake. Also, similar results where found from the study conducted in Makkah Almukaramah (2,17). The monthly incomes as a socio demographic variables showed a significant difference (P<0.000) & correlated with the awareness of FA intake, contrary to that the study run in Hail-Saudi Arabia where the monthly income did not

correlate with awareness and knowledge of FA (10,15,17).
The proper time of taking FA supplements is very important for the normal development of the nervous system of fetus & to reduce the risk of NTDs. The results from different studies showed that most women start taking FA after they knew of their pregnancy between 2nd -4th week of the gestation & missing the sensitive period of neural tube development. Only (33.7%) knew that it must be taken during preconception as early as 1st 12 weeks, similar to figures seen in Hail-Saudi Arabia (10%) & to Lebanon (24.7%) (15,19).
The results showed that the main sources of information is the doctors, 279 (71.2%) followed by friends & family (38.1%) & lastly by the media (18.6%). These results were similar to other studies in Turkey and Lebanon. In Qatar (63.4%) depended on doctors, (44.4%) in Taipei while in Egypt the percentage was 92%. This placed a heavy burden on the doctors to advice all married women in childbearing age to take FA supplements when they are planning to be pregnant and at this point there is need to explain the core information with emphasis on the role of FA in preventing NTDS. The study conducted by Amtaietal also suggested the use of every child vaccination event as an opportunity to encourage the use of FA (5,16,18,20).
The part of the study that compared the level of information before and after reading the brochure was focused on main core information of FA supplements including timing, doses, role and natural resources. A significant difference was found (P<0.000) in the participants who reported knowing of FA role became 432 (86.2%) after the brochure in comparison to those before 193 (56.9%). After the brochure 348 (69.5%) reported that the proper time of initiating the use of FA was during the period of fertilization showing significant difference of (P<0.000). 256 (52.9%) stated the correct dosage of less than 1mg after reading the brochure rather than (only14.6%) before it. Lastly, there was an improvement in the information held about natural diets rich in FA, 324 (64.7%) cereals, 452(91.2%) vegetables & 365(72.9%) fruits, all showed significant difference (P<0.000, P<0.000, P<0.000) similarly to Makkah & Emirate studies (2-3).
Looking at the above figures, it was clear that there was a real evidence of changing in the trend towards folic acid. Similar results were shown & confirmed by other studies to the need for an educational campaign to increase the awareness of FA role & benefits **(**9,13,19). Women who take FA supplements without knowledge of its benefits, may not continue using it, but knowledge of the exact role of FA in preventing NTDs will make them more committed to its administration during the critical time using the right dose (5,10,18). Campaigns, books, newspapers and advertisements are other medias that can be used to publicize the core information of FA supplementation to target the awareness in the whole society (8,14,19,21).

LIMITATIONS

This study depends exclusively on women visiting KAUH outpatient's clinics, thus excluding other women in the community. 276 (55.1%) of the participants were of the group age above 30 with means scores (31.8±7.1) for age & (3.1±2.4) for gravidity. Bias may be found in the responses of the participants as its validity was not confirmed.

CONCLUSIONS

There is a difference in the level of knowledge about folic acid among women in reproductive age. The participants were more familiar with general than specific information and this leads to gaps between knowing and acting. In this study, there was an evidence of changes in the knowledge & attitude after the distribution of the brochure in order to improve women's knowledge about folic acid's role in preventing congenital anomalies particularly NTDs. Awareness campaigns need to be conducted to target benefits of folic acid and the optimum period of administration. The information must be more inclusive & easy for the general public to understand and need to include the important topics that doctors must discuss with women in the age of childbearing. Doctors should recommend them to take folic acid supplements before, and not only after conception. This information can be inserted in the high school curriculum as well. More research needs to be conducted about the awareness level & the appropriate ways to deliver this information.

ACKNOWLEDGMENT

The Authors would like to acknowledge the following medical students (Amal Al-malki, Wala'a Alzahrani, Me-aad Almotiri, Rewaa Nasser AlQurashi, Saja Alghamdi, Badreyah Al-daui, Ebtehag Al-sulami, Rawan Alamri, Bashair Almunami, Haneen Alshehri, Ghada Raja Alharbi, Hajar Halawani ,Athal Filemban, Rahaf Almoallim, Neda Aboulola, Esraa Al-Ahdal, Yasmina Mahsoun, Farah Aljuhani) for their efforts in collecting the data.

REFERENCES

[1] Hilton J J (2007)"A comparison of folic acid awareness and intake among young women aged 18–24 years". *J Am Acad Nurse Pract.*
[2] Reham Saleem Al-Ahmadi, (2014), "Use of folic acid among pregnant women attending antenatal care clinic at Al-Hejrah primary health care center, Makkah Al-Mokarramah, SaudiArabia", *Int J Med Sci Public Health*, 3 (8) :963-969.
[3] Mariam S Alkaabi, Lamia K Alsenaidi and Hisham Mirghani, (2013),"Awareness and knowledge of the use and benefits of folic acid supplements in women in the United Arab Emirates", *Hamdan Medical Journal*, 6:385–388.
[4] Huan Liang,Duan Ma,Shu-Feng Zhou,Xiaotian Li, (2011), "Knowledge and use of folic acid for birth defect prevention among women of childbearing age in Shanghai,China: A prospective cross-sectional study". *Med Sci Monit*, 17(12):87-92.

[5] Johannes Bitzer, Arianevon Stenglin, Ralf Bannemerschult. (2013)."Women's awareness and periconceptional use of folic acid: data from an arge European survey". *International Journal of Women's Health,* (5)201–213.

[6] Horn F, Sabova L, Pinterova E, Hornova J, Trnka J, (2014)"Prevention of neural tube defects by folic acid–awareness among women of childbearing age in Slovakia", *Bratisl Lek Listy,* 115(2):91-97.

[7] W. Al-Darzi, F. Al-Mudares, A. Farah, A. Ali and D. Marzouk (2014),"Knowledge of periconceptional folic acid use among pregnant women at Ain Shams University Hospital, Cairo, Egypt ". *Eastern Mediterranean Health Journal*, 20(9):561-568.

[8] Jameela A. Kari, Ekhlas S. Bardisi, Rabaa M. Baitalmal, Ghofran A. Ageely, (2008),"Folic acid awareness among female college students-Neutral tube defects prevention", *Saudi Med J*, 29(12): 1749-1751.

[9] Patricia Mc Walter, Amal Al Shmassi, Abdelmoneim Eldali (2015),"Awareness and Use of Folic Acid in a Clinic- Based Saudi Pregnant Population, Saudi Journal of Medicine& Medical Sciences", 3(2) :141-145

[10] Michelle Lamb, Lyndsey N. Hogg (2013),"Folic Acid Awareness vs. Supplementation: A New Tool to Bridge the Gap". *Journal of Health Care for the Poor and Underserved* (24):859–863.

[11] Centers for Disease Control and Prevention (CDC) (2007),"Trends in folic acid supplement in take among women of reproductive age California, 2002-2006". *MMWR Morb Mortal Wkly Rep*; 56:1106-1109.

[12] Blencowe H, Cousens S, Modell B, Lawn J (2010),"Folic acid to reduce neonatal mortality from neural tube disorders ". *Int J Epidemiol*; 39(Suppl1):110-121.

[13] Bashaier Ahmad, Nehal Anam, Norah Khalid, Reem Mohsen, Lena Zaal, Esraa Jadidy and Somaya Alalati,(2013), "Perceptions of women of reproductive age about vitamin and folic acid supplements during pregnancy, Taibah University, Almadinah", Almunaw warah, Kingdom of Saudi Arabia , *Journal of Taibah University Medical Sciences*,8 (3):199-204.

[14] Oriol Colla, Sonia Pisaa, Montserrat Palacioa, Llorenc¸ Quinto´b, Vicenc¸ Cararach ((2004), "Awareness of the use of folic acid to prevent neural tube defects in a Mediterranean area *". European Journal of Obstetrics & Gynecology and Reproductive Biology* (115):173–177.

[15] Claudine Nasr Hage, Maya Jalloul, Mohamad Sabbah, Salim M.Adib,(2012),"Awareness and Intake of Folic Acid for the Prevention of Neural Tube Defects Among Lebanese Women of Child bearing Age". *Maternal Child Health J*, 16:258–265.

[16] Abdulbari Bener, Mohammed G. A. A Maadid, Daoud A.E. Al-Bast, Saleh Al-Marri, (2006), "Maternal knowledge, attitude and practiceon folic acid intake among Arabian Qatari women". *Reproductive Toxicology*, (21):21–25.

[17] Murad Al-Holy, Ala'a Eideh, Suneetha Epuru1, Dima Abu-Jamous1, Ibrahim Ashankyty, (2013), "Awareness of Folic Acid Intake among Women in the Childbearing Age in Hail Region- Saudi Arabia". *Food and Nutrition Sciences*, (4):49-55.

[18] Zeynep Baykan, Ahmet O¨ztu¨rk, Serpil Poyrazog lu, Iskender Gu¨n, (2011),"Awareness , knowledge, and use of folic acid among women : a study from Turkey". *Arch Gynecol Obstet* (283):1249–1253.

[19] Ali A. Al-Akhfash, Abdelmagid M. Abdulla, Amani M. Osman, JulnarI. Abdulgafar, Abdulrahman A. Almesned, (2013),"Maternal knowledge and use of folic acid among Saudi females', *Saudi Med J*, 34 (11):1173-1178.

[20] Ziqian Zeng, Ping Yuan, Yanping Wang, XiMa and Jun Zhu, (2011), "Folic acid awareness and intake among women in areas with high prevalence of neural tube defects in China: across-sectional study ". *Public Health Nutrition*, 14(7):1142–1147.

[21] Lutfi Jaber, Igbaria A. Karim, Abu Moch Jawdat, Mawasi Fausi, Paul Merlob, (2004),"Awareness of folic acid for prevention of neural tube defects in a community with high prevalence of consanguineous marriages". *Annales De Génétique, (*47):69–75.

Source of Financial Support: Nil

Conflict of interest: Nil