

## Impact of Counseling to Child Bearing age Women for Prevention of Neural Tube Defects by Periconceptional Folic Acid Supplementation

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### Abstract:

**Background:** Childbearing woman needs to start the folic acid intake at least four weeks before conception and continue it throughout the first trimester of pregnancy to help with the prevention of neural tube defects (NTDs). Hence, counseling and awareness by health care professionals influence strongly in order to overcome these burdensome issues to the women and their families.

**Objectives:** To determine the impact of counseling on childbearing age Women for Prevention of Neural Tube Defects by Periconceptional Folic Acid Supplementation in Pakistan.

**Methodology:** A descriptive survey design was carried out to conduct this study in the Obstetrical Outpatient departments of local teaching Hospitals of Lahore. A total of 300 pregnant women were studied to see the impact of counseling of healthcare professionals regarding supplementation of folic acid in order to minimize the Neural Tube Defects. Nonprobability convenient sampling technique was used for the purpose. Data were collected by a self-administered questionnaire and was analyzed by SPSS version 20. Frequencies and percentages were calculated.

**Results:** The results signified that a major fraction of pregnant women 101 (33.6%) used to visit the healthcare professionals after elapsing the critical phase of organogenesis. Although the main source of provision of health-related information was found the health care professionals, it was also observed that only a few of pregnant women used to visit them. Furthermore, health care professionals used to provide counseling for folic acid use in the first trimester of pregnancy, but regarding supplementation of folic acid before pregnancy, no evident authentic information was provided to women of childbearing age.

**Conclusion:** Findings of the study suggested that the health care professionals need to provide awareness at all the levels of health care regarding periconceptional folic acid supplementation. In addition, women should visit the professionals in the early antenatal period as well as before conception.

**Key Words:** Counseling, Folic Acid, Neuropores, Neural Tube Defects, Periconceptional Period

### CONTRIBUTION OF PAPER

- Birth defects related to folic acid deficiency are as preventable as polio and as a public health measure; equally urgent. Women not currently taking a multivitamin could be motivated to do so if advised by the health care professionals like nurses who provide them holistic care during their stay in hospital as well as community midwives, lady health workers can impart their role.
- In Pakistan, due to convenient access, women (primigravida and multigravida both) most likely prefer to take health care advice (After missing their first menstrual period) from community midwives, lady health care workers first before consulting a doctor or gynecologist. Therefore, counseling at primary health care level regarding folic acid supplementation before and during pregnancy should be optimized to reduce the burden of neural tube defects in Pakistan and to

minimize the sufferings of the family who have a child with severe congenital Neural Tube Defects.

## INTRODUCTION

Folic acid is a micronutrient vitamin B9, which is required in double amount during pregnancy. It plays a vital role in the development of spine, brain, and skull of the fetus. Deficiencies of folic acid have been linked to congenital neural tube defects (NTDs) in the fetus. Many pregnancies are unplanned and are not confirmed until the critical period 17 to 56 days after conception has taken place. When the woman becomes aware of the conception, it is already too late to start folic acid supplementation (Tripathy SN, 2014).

Besides folic acid supplementation, two other suggested etiologies of neural tube defects are genetic and nutritional factors that can affect red cell folate levels. It is believed that NTDs (Anencephaly, Spina bifida, Encephalocele) is caused by a mutation in an enzyme called Methylene tetrahydrofolate that is necessary for conversion of homocysteine to methionine. This leads to increased homocysteine level and thus degenerate spinal cord and peripheral nerves. Half of all infant deaths are attributed to four causes: 1) congenital malformations/birth defects; 2) disorders related to prematurity and low birth weight (LBW); 3) sudden infant death syndrome (SIDS); 4) maternal complications of pregnancy (Cabrera RM, Hill DS, Etheredge AJ, Finnell RH, 2004)

A woman's diet is directly linked to her offspring; this is true even before conception. A childbearing woman needs to start the folic acid intake at least four weeks before conception and continue it throughout the first trimester of pregnancy to help with prevention of neural tube defects (NTDs). After cardiac abnormalities; NTDs are the second most frequent group of serious birth defects. They are troublesome to patients, caregivers, healthcare systems and the society. NTDs are the result of abnormalities in neurulation (closure of the neural folds and neuropores to form the neural tube) a process that is normally completed by 28 days post-conception and usually before a woman knows she is pregnant. Although NTDs have multiple etiologies, several studies in the 1990s established that periconceptional dietary folate, supplementation of folic acid and/or supplemental multivitamins containing folic acid help prevent NTDs (Tilford jet al, 2005).

Every woman of reproductive age who is capable of becoming pregnant is also being emphasized for preconception care, regardless, whether she is planning to conceive or not. Care before and during pregnancy is aimed at identifying and modifying biomedical, behavioral, and social risks through preventive and therapeutic interventions. Key components are a risk assessment, health promotion, and medical and psychosocial interventions (Lu MC, 2007).

Studies have revealed that interventions may alleviate risk and enhance health effects if carried out at least three months before and during the first trimester of pregnancy. By increasing motivation for provision of care, health care providers have the opportunity to maintain broad-based programs and services aimed at improving the health of women, children, and families. Prenatal care alone is not sufficient to bring necessary change in these contributors to infant mortality; thus, other preventive strategies for the purpose are needed like preconception care (U.S. Department of Health and Human Services, 2006)

Folic acid supplementation reduces NTDs, as data of 2006 for Ontario, Canada indicated that 40% of females in the reproductive age had RBC folate below 900 nmol/L and half (20%) among these were below 700 nmol/L; folate level of 900 nmol/L or greater being necessary for maximum protection against NTDs. On the basis of this information, it can be estimated that approximately 200,000 pregnant Canadian women are sub-optimally protected against NTDs each year (Cordero JF, Do A, Berry RJ, 2008)

Birth defects are the leading cause of infant mortality and have been causing 22% of all infant deaths for the past 25 years. Approximately, 3–4% of all live births are affected by a birth defect; the aetiologies for most of them are unknown. The association between serious birth defects and their avoidance by folic acid is well

established. Mostly, the data about birth defects focus on the justifiable relationship between folic acid and prevention of neural tube defects (**Lawn JE, Wilczynska-Ketende K, Cousens SN, 2006**).

In Pakistan, the incidence of NTDs is at the highest range of the whole world estimation due to inadequate supplementation of folic acid. The contributing demographic characteristics in improper practice of folic acid intake in the periconceptional period are lack of information, inadequate knowledge, and unplanned pregnancy. About three million pregnancies in Pakistan are unplanned and without using an effective method of birth spacing due to lack of family planning education. Currently, the birth rate in Pakistan is 4/ 100 women, while in Bangladesh, it is 2/100 women. (**Islamabad, the Nation, 22 November 2013**).

Low socioeconomic status, antenatal visit near-term pregnancy or after safe usage period has become a dilemma for our country. In order to overcome these problems and to compete with rest of countries, Government of Pakistan had started an interventional project in 2007 by flour fortification with Folic Acid, and that is near to completion in December 2013. The outcomes of this fortification in Pakistan are not still evident and need further researches as well (**Report on flour fortification, Dawn newspaper, 17 July 2012**)

Even in this era of the informational technology revolution, there is still a lot to do to improve the information system to promote healthcare awareness. Lack of information for the folic acid use in inappropriate period is one of the major contributing factors. According to a **March of Dimes (2003)** survey, 89% of women report that they would be more likely to take folic acid if advised by health care providers. Among women who are aware of folic acid, only 30% cite health care providers as the source of information.

## **METHODOLOGY**

A simple cross-sectional descriptive survey design was carried out to conduct this study in the Obstetrical OPDs of local teaching hospitals in Lahore. A total of 300 pregnant women were studied for the purpose to see the impact of health care provider's counseling to Women of childbearing age for prevention of Neural Tube Defects by Periconceptional Folic Acid Supplementation. The sample was taken from Lahore General Hospital, Lady Aitchison Hospital, and Jinnah Hospital Lahore by using convenient sampling technique. The data was collected through self-administered questionnaire. The questionnaire was developed precisely in English and then was translated into the Urdu language to assess health care provider's counseling to Women of childbearing age regarding folic acid supplementation. All the ethical aspects of the study were taken care of, and informed consent was taken for voluntary participation.

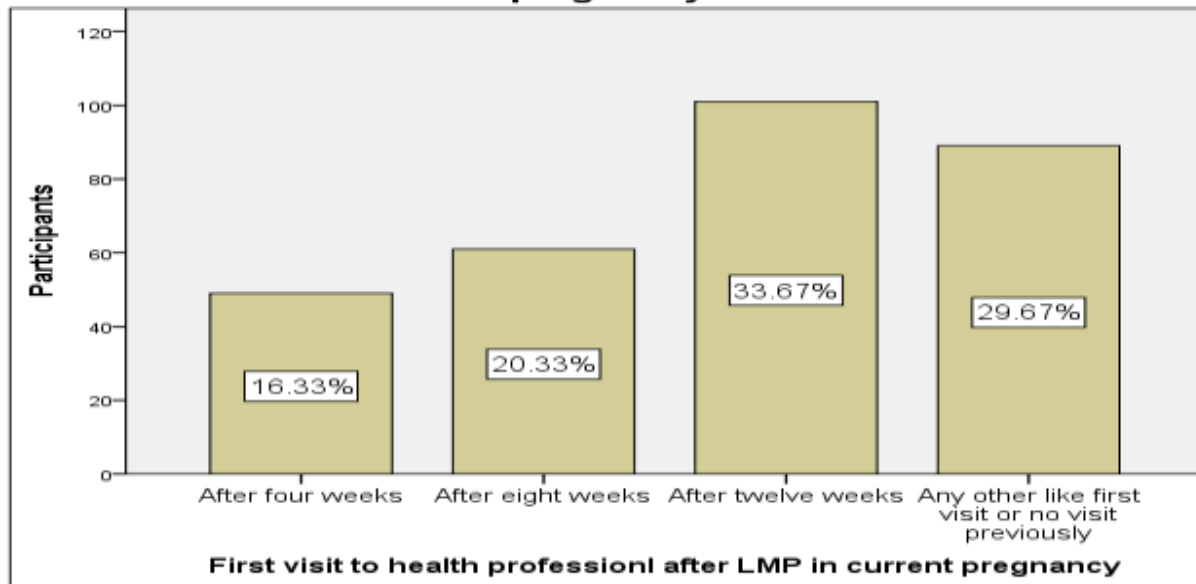
## **STATISTICAL ANALYSIS**

The data were analyzed by SPSS version 20 and represented in the form of figures, tables, and percentages. Frequencies and percentages were calculated for categorical variables. Multiple comparisons were made according to specified variables.

## **RESULTS**

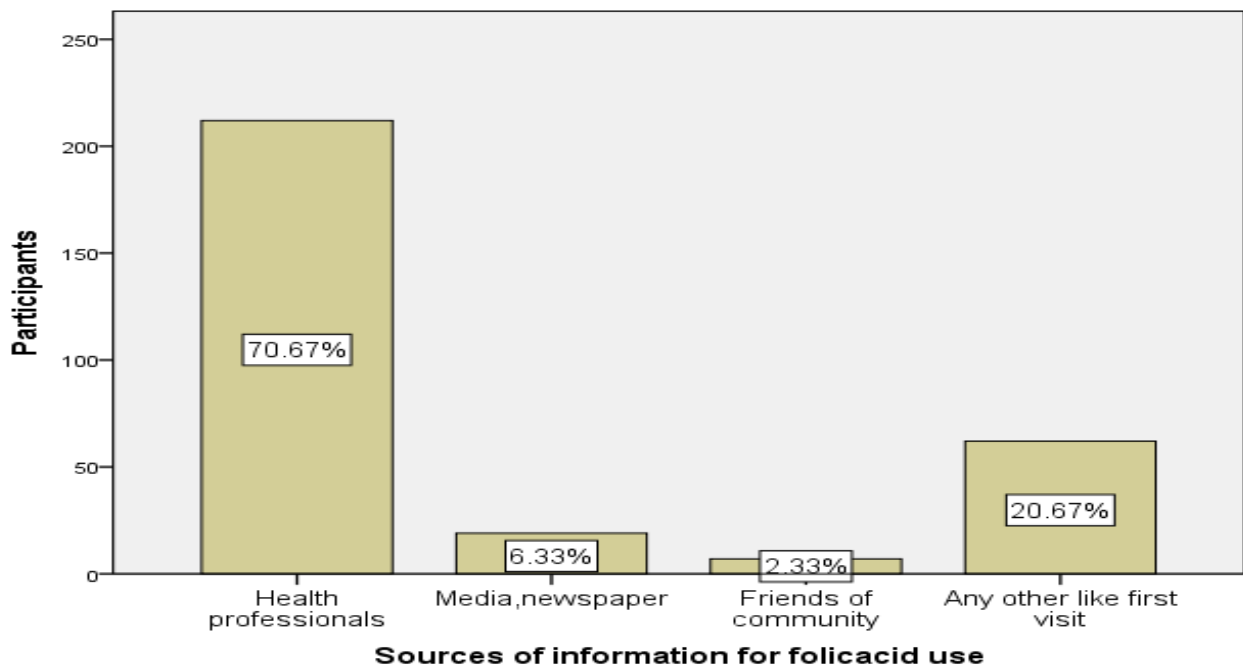
As there is a dearth of literature about folic acid supplementation in Pakistan, therefore it is of extreme importance to investigate the knowledge of pregnant women about the use of folic acid in periconceptional period and its requisition in context of micronutrient supply. The existing study was carried out to explore gaps in practices about folic acid supplementation.

**First visit to health care professional after LMP in current pregnancy**



Analyzing the first visit to health care professionals after LMP (Last Menstrual Period), it was found that 101 (33.6%) pregnant women had their first visit to health care professionals after twelve weeks (after critical phase of organogenesis), 49 (16.3%) women had their first visit after four weeks (during critical phase of organogenesis), 60 (20.3%) had their first visit after eight weeks, and 90 (29.6%) women had not visited at all due to increased parity as shown in the figure.

**Sources of information for folic acid use**



A major source of information for a folic acid use found in this study was information disseminated through health care professionals as reported by 212 (70%) out of 300 pregnant women; whereas, 62 (20%) were those pregnant women who had their first visit due to decreased parity like primigravida.

**Table- 4.1****Did your health care provider give you any information for folic acid use before pregnancy?**

<b>Information for folic acid use before pregnancy by health care providers?</b>	<b>Frequency</b>	<b>Percentages</b>
<b>Yes</b>	30	10
<b>No</b>	217	72.3
<b>Don't Know</b>	53	17.7
<b>Total</b>	300	100

As the major source of information was health care professionals, the majority of pregnant women 217(72.3%) claimed that no information was given to them for folic acid use before pregnancy by any health care professionals while 30 (10%) women had information for folic acid use before pregnancy by healthcare professionals. It was reported by 53 (17.7%) women that they don't know regarding any information of folic acid use before pregnancy provided by health care professionals due to illiteracy, young age, and decreased parity status.

**Table- 4.2****Did your health care provider give you any information for folic acid use after pregnancy?**

<b>Information for folic acid use after pregnancy by health care providers?</b>	<b>Frequency</b>	<b>Percentages</b>
<b>Yes</b>	209	69.7
<b>No</b>	37	12.3
<b>Don't Know</b>	54	18
<b>Total</b>	300	100

As the major source of information was health care professionals, a substantial majority of pregnant women 209 (69.7%) claimed that information was given to them for folic acid use after pregnancy by any health care professionals while 37 (12.3%) women had no information for folic acid use after pregnancy by healthcare professionals. It was reported by 54 (18%) women that they don't know regarding any information of folic acid use after pregnancy provided by health care professionals due to illiteracy, young age, and decreased parity status.

## DISCUSSION

It is well-known that folic acid use before and during pregnancy is associated with a significantly lower risk of having a child with congenital neural tube defects. It was shown in two independent clinical trials in 2002, 2003, that supplementing a woman's diet with folic acid before and during early pregnancy reduced the prevalence of NTDs upto 70 % (**Barkai G et al., 2002**).

In the current study, 101 (33.6%) women (majority) were visiting health care professional **after** passing the critical phase of organogenesis (after twelve weeks), and at this time there is no use of taking folic acid.

According to **March of Dimes survey (2003- 2008)**, regarding the sources of knowledge about folic acid, generally most of the study participants obtained their knowledge of FA intake from medical care providers (77.7%), including physicians, nurses, dietitians, and midwives as it is evident from the results of this study that major (71%) source of information were health care providers. It was also interpreted from the results of this study that majority Pakistani pregnant women had no information for folic acid use by health care providers before pregnancy and these results lead to a poor level of knowledge among pregnant women. It is, therefore, suggested that health care professionals can play a vital role in enhancing the level of knowledge of women regarding periconceptional folic acid supplementation and utmost efforts should be made towards imparting knowledge of the use of folic acid incorrect time period.

Statistically significant results were also found between parity and level of knowledge. It was evident that women having two or three children were more aware regarding folic acid use as compared to primigravida who visited for the first time and had no idea of folic acid use before pregnancy due to poor knowledge.

## CONCLUSION

So, it is highly **concluded that** women should visit health care professionals after missing a first menstrual period and possibly after confirmation of pregnancy.

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