

## KNOWLEDGE AND USAGE PATTERN OF FOLIC ACID AMONG MEDICAL STUDENTS OF RAWALPINDI

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### ABSTRACT

**Background:** Neural Tube Defects (NTDs) are birth defects of brain and spinal cord that can result in permanent damage to the brain, resulting in lifelong disability or even death. The NTDs include spina bifida, anencephaly, hydrocephalus etc. NTDs affect 0.5-12 in every 1000 pregnancies worldwide.

**Objective:** 1. Assess knowledge regarding periconceptional use of folic acid among medical students. 2. To identify the demographic and social factors that affects the knowledge of folic acid use in medical students. 3. To find out the attitude of students and their practice regarding use of daily multivitamin supplements.

**Study Design:** Cross sectional study.

**Place and Duration of Study:** Rawal Medical and Dental College Islamabad, from Mar to Aug 2016.

**Material and Methods:** Sample size of 154 was selected through simple random sampling. Structured questionnaire was used to collect data.

**Results:** Total 154 final year medical students were included in the study. From all study participants, 38% (59) were male and 62% (95) were female. Residence distribution of 154 respondents was, 28 respondents were resident of rural setting while 126 were living in urban areas. Out of 154 study participants, 50 were boarder and 104 were non-boarder. Knowledge about folic acid was 43% (66). Association between folic acid use and knowledge was statistically significant.

**Conclusion:** Higher proportion of respondents having good knowledge about folic acid intake was residing in urban areas while this is also not an important characteristic to be associated with knowledge of a person. Parental education also is not an important variable capable of influencing respondent's knowledge or their practices.

**Keywords:** Folic acid, Knowledge, Medical Students, Practices.

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### INTRODUCTION

Neural Tube Defects (NTDs) are birth defects of brain and spinal cord that can result in permanent damage to the brain, resulting in lifelong disability or even death. The NTDs include spina bifida, anencephaly, hydrocephalus etc. NTDs are congenital abnormalities caused by failed closure of the embryonic neural tube which would otherwise be complete by 4 weeks of pregnancy. NTDs affect 0.5-12 in every 1000 pregnancies worldwide<sup>1</sup>. Folic acid or folate is a B vitamin. It is present in vegetables especially green leafy vegetables, fruits, beans, peas, nuts, eggs and meat. Over the last couple of decades a

link is established between deficiency of folic acid in the diet of the mother during the periconception period and occurrence of NTDs in newborn. It was observed that neural tube defects were more prevalent in low socio-economic groups. It was also noted that during famines and other situations when food supply was disturbed, incidence of neural tube defects increased. This led to the hypothesis that NTDs may be linked to nutritional deficiency. The 1991 international Medical Research Council double blind randomized controlled trial was the first to show without any doubt a link between.

Folic acid supplementation and NTD reduction. There was a 72% reduction in NTDs among newborns born to women who were

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taking folic acid supplements (MRC Vitamin Research Group 1991). Since then, various scientific studies have proved that supplementing the diet of women with 0.4 to 4 mg folic acid a day 4 weeks before and 8 weeks after conception reduces the birth of newborns with NTDs remarkably<sup>2</sup>. It was thus realized that NTDs are congenital abnormalities which could be prevented by public health measures.

National nutritional survey of Pakistan 2011 show that of all pregnant women 25.3% consumed folic acid (35.7% in urban areas and 20.7% in rural areas). The survey also showed that in 2011, 58.9% of mothers received ANC from a skilled provider of which 49.5% received care from a qualified doctor, the rest from nurses and LHVs. A study conducted in PEMH and CMH, Rawalpindi (2012-2013) among women of childbearing age (21-42 years of age) showed that only 54.75% were informed by their doctors about the importance of Folic acid in prevention of birth defects. This clearly shows a gap between mothers who receive ANC and yet do not take folic acid supplements<sup>2</sup>.

Studies show that despite knowledge of benefits of daily Folic acid use, healthcare providers did not necessarily counsel their patients about FA use<sup>3</sup>. Furthermore, those healthcare providers who were taking daily supplements were more likely to advise their patients to take supplements<sup>4</sup>. This lack of communication between patients and healthcare providers is attributed to time constraints and other responsibilities in clinical practice<sup>5</sup>. The low use of folic acid supplementation among women of child bearing age may be due to the fact that good knowledge about the benefits and use of folic acid may be low among health care providers; therefore it is important to check the knowledge and beliefs of healthcare professionals regarding folic acid. An observational study to assess the knowledge of final year medical students about the use and benefits of folic acid would help understand the standard of medical education in the country and what improvements need to be made in educational system.

## Objectives of the Study

Assess knowledge regarding periconceptional use of folic acid among medical students.

To identify the demographic and social factors that affects the knowledge of folic acid use in medical students.

To find out the attitude of students and their practice regarding use of daily multivitamin supplements.

## MATERIAL AND METHODS

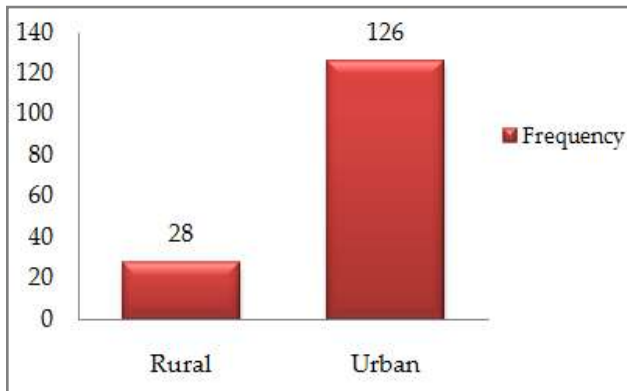
This was a prospective cross-sectional single centered study conducted in Rawal Medical and Dental College, Islamabad using simple random sampling, from August 2016 to February 2017. Sample of 154 was collected from medical colleges. Sample size was calculated through Open epi software at prevalence of 11.3%. Nominal roll of the final year students was taken from the college administration. Computer generated random number tables were obtained. All final year medical students randomly selected from the students present at the time of study were included in the study whereas all married students and foreign students were excluded. Structured and modified self administered questionnaire was used. Analysis was done using the statistical software SPSS version 21. Frequencies and percentages were calculated for categorical variables. Knowledge was assessed by calculating the knowledge score of the study participant. Score of knowledge questions was calculated at individual level of study participants. Chi-square test to demonstrate the association of the socio-demographic variables with the knowledge and actual use of folic acid. Ethical approval was sought from institutional review board coupled with patients signing written informed consent.

## RESULTS

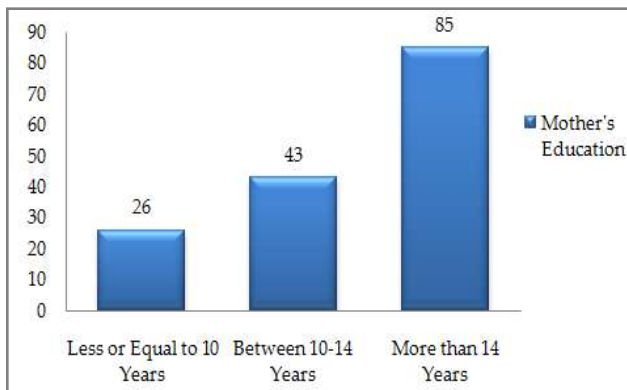
Total 154 final year medical students were included in the study. Out of 154 study participants, 38% were male and 62% were female. Residence distribution of 154 respondents

was, 28 respondents were resident of rural setting while 126 were living in urban areas. Out of 154 study participants, 50 were boarder and 104 were non-boarder, 38% (59) of the participants were male and 62% (95) were female.

Knowledge was assessed by calculating the knowledge score of the study participant. Score of knowledge questions was calculated at individual level of study participants. Knowledge of the study participants regarding folic acid



**Figure-1: Percentage of study participants according to residence.**



**Figure-2: Study participant's mother education.**

supplement was assessed and 43% (66) of the participants have good knowledge and 57% (89) have poor knowledge.

Study participants were divided according to their residence and 28 and 126 were rural and urban accordingly out of 154 as shown in fig-1.

Education of the mother of study participants was divided into three categories and those were less or equal to 10 years, between 10-14 years and more than 14 years and

distribution was 26, 43 and 85 respectively as shown in fig-2.

Education of the father of study participants was divided into three categories and those were less or equal to 10 years, between 10-14 years and more than 14 years and distribution was 16, 34 and 104 respectively.

When profession of mother of study participants was analyzed, 33% were employed and 67% were house wives.

Employment status of the father of study participants was analyzed and 74% of them had private job and 26% having government job.

Folic acid supplement use was assessed among study participants and only 14% of the participants were taking folic acid supplement and 86% were not taking.

Knowledge was assessed by calculating the knowledge score of the study participant. Score of knowledge questions was calculated at individual level of study participants. Knowledge of the study participants regarding folic acid supplement was assessed and 43% of the participants have good knowledge and 57% have poor knowledge.

Knowledge of the medical students was cross tabulated with folic acid intake. Relationship found statistically significant i.e  $p=.010$  as shown in table-I. Results showed that only 15% who had good knowledge were in practice of taking folic acid whereas 51% who had good knowledge were not taking folic acid.

39 (25.3%) of females had better knowledge regarding folic acid intake as compared to males i.e 27 (17.5%) and 57 (37%) urban students had good knowledge about and only 9 (5.9%) had poor knowledge about folic acid intake.

## DISCUSSION

This cross sectional study highlights the importance of folic acid intake knowledge and practices among medical students. Majority of the respondents in our study were unaware regarding the knowledge and practices of the importance and intake of folic acid.

In our study the knowledge of medical students was not good (43%) which differs from the results of the other studies. However, this level of awareness is favorable as compared to that observed in a recent survey of 488 obstetrician-gynecologists among whom 96.5% were aware that NTD can be protected by the use of preconceptual folic acid supplementation<sup>6</sup>. In contrast to these results, a survey conducted in U.S. women of childbearing age found that only 13% knew that folic acid can prevent NTD. Less than half (47.7%) of health professionals had sufficient knowledge about preconceptions folic acid use. In-depth interview from nurses and

curriculum gives emphasis for communicable disease than congenital abnormalities. Whereas, the study in Florida was done in developed countries, in which congenital abnormalities get better attention.

Our results showed that only 14% of medical students were using folic acid or multivitamin supplement. William's *et al* conducted a study regarding folic acid and its practices among doctors. The results showed that only those medical students or doctors were using folic acid or multivitamin who have higher rate of prescribing folic acid or multivitamin use<sup>4</sup>. About 56.1% of health professionals had knowledge of

**Table-I: Association of independent variables with the folic acid intake.**

Variables	Folic Acid or Multivitamin Supplement Usage (n=154)		p-value
	No Intake	Intake	
Poor Knowledge	81 (52.6%)	7 (4.5%)	p=0.010
Good Knowledge	51 (33.1%)	15 (9.7%)	
Rural	25 (16.3%)	2 (1.3%)	p=0.25
Urban	106 (69.3%)	20 (13.1%)	
Less or equal to 10 years mother's education	21 (13.6%)	5 (3.2%)	p=0.72
Between 10 to 14 years mother's education	37 (24%)	6 (3.9%)	
More than 14 years mother's education	74 (48.1%)	11 (7.1%)	

**Table-II: Knowledge about folic acid or multivitamin supplement.**

Attribute	Knowledge (n=154)		p-value
	Poor Knowledge	Good Knowledge	
Male	32 (20.8%)	27 (17.5%)	p=0.56
Female	56 (36.4%)	39 (25.3%)	
Rural	18 (11.8%)	9 (5.9%)	p=0.25
Urban	69 (45.1%)	57 (37.3%)	

midwives reported low level of knowledge which is in relevance with the study findings in developing countries<sup>6,7</sup>. Lack of refreshment training and guidelines on the topic may be a reason of low level of knowledge. Additionally, majority of the participants have not worked in ANC clinic, labor and delivery ward, which can likely be the reason of their lack of knowledge about congenital abnormalities and its preventive methods. Nevertheless, this finding was lower in comparison to the study finding in Florida (58%)<sup>8</sup>. This discrepancy might be due to difference between study settings. This study was done in developing country, in which the

the benefit of folic acid and 21.9% of respondents had knowledge on the recommended period in which folic acid is prescribed to prevent birth defect. The occurrence and recurrence prevention dose of folic acid was observed in only, 5.1% and 2.5% of respondents respectively; this finding was lower than previous study findings<sup>6,7</sup>. Which may be due to the difference between study settings and study subjects. The curriculum, refreshment training and directions on service provision are different between the settings. Age was one determinant factor for knowledge of health professionals on periconception folic acid use. In this study, professionals whose age was

less than 30 years old were 1.7 times more likely to have sufficient knowledge than their counterparts. This might be due to the fact that younger health professionals had attended their education recently and they had motivation to learn up to date information. Professional category had significant association with their knowledge level on preconception folic acid use; general practitioners and midwives had better knowledge than nurses. General practitioners were 34 times and midwives were 2 times more likely to have sufficient knowledge compared to nurses or health officers. Similar findings were also reported from the in-depth interview. This finding was in consistency with the study findings in Israel and United States<sup>9</sup>. This might be due to difference in the curriculum; doctors and midwives took courses on congenital abnormality and their protective methods in detail than other health professionals. Moreover, physicians and midwives commonly work in ANC clinics and delivery wards, so, they may have experience to assist delivery with birth defect and thus more likely a chance for research and knowledge on the preventive methods<sup>8,9</sup>.

A population based study was conducted in Dublin City which results reflected that the response to knowledge regarding folic acid was higher (84%). A community survey was held among women aged 15-44 which reflected that a little less than two-thirds (63.7%) of the women surveyed had heard of folic acid and also the study conducted in Hackney mothers revealed a little lower rate of knowledge than 67%. It is assumed that the level of knowledge among those who were born recently would be greater. In 1995 a national survey was conducted in the United States which results determined that the level of knowledge is significantly higher than the rate, where 52 percent of folic acid had been heard. Milner's hospital-based study results also revealed higher percentage of women 58% being aware of use of folic acid. However, in the Milner study a larger proportion of women appear to be in the disadvantaged group. In our study, knowledge was significantly associated

with all variables indicating prosperity and education, and confirming that less educated and disadvantaged women are less aware of folic acid and their importance which is a challenge for all health care professionals<sup>10</sup>.

A study in Leeds revealed that only a few women (8.7 percent) received advice on the intake of folic acid before conceiving while only 1.6 per cent of women were counseled on their first prenatal visit. Only 7 percent of our respondents had taken folic acid before they became pregnant and only 2.7 percent of the group was present. Milner<sup>14</sup> has shown that many pregnancies in Dublin are unplanned, especially among less well-off women, of whom 60% are unplanned<sup>11</sup>. Thus, our study suggests that the existing levels of preconceptional folic acid use are unlikely to have a significant impact on the birth prevalence of neural tube defects. The advice for folic acid use among women is interesting from the point of view of the health care worker, as they strongly contrast with the actual sources of knowledge about folic acid. The preferred sources were the GP followed by the pharmacist. Although a majority of the group (90.4 percent) of Spina Bifida, only 12.6 percent said that a deficiency of folic acid caused it. Three quarters of the group would be willing to take a vitamin if it could be shown that this vitamin could reduce but did not prevent birth defects, and the preferred way of acquiring this vitamin was in tablet form<sup>12</sup>.

The unfavorable practice of taking tea immediately after eating was more common among students of group I. Food-based strategies to address iron deficiency anemia among Indian women include consumer education to promote the diversification of the diet to include iron-rich foods, Improving the popularity and accessibility of the consumer as well as the behavior to foods and fruits that contain vitamin C which increases the iron absorption. Group II was the most common cause of anemia in children was decreased ingestion and worm infestation (92%) and reduced intake and diarrhea was reported by group I (72%). Previous studies showed that

schistosomiasis and malaria and are the main risk factors for anemia in young adults<sup>13</sup> 13.88% of pupils in group I and 96% of group II students said ferritin as a storage form of iron, while students in both groups used apoferritin as a storage form.

Both groups had an attitude that pubertal girls should consume diet rich in iron, and also pregnant and lactating women need an iron supplement in addition to a balanced diet. Iron and folic acid supplementation in pubertal girls goes a long way in building their iron stores. By targeting young girls who soon enter married life and motherhood, a lasting solution to the problem of anemia in pregnant women can be tried<sup>14,15</sup>.

### CONCLUSION

Ending up with conclusion, not all characteristics are important in improving knowledge or intake practice according to the present study. This study viewed knowledge only as an important aspect/factor rendering its relationship with intake practice as significant.

An integrated health and education system needs to be activated through health education and health education activities, reaching to the highest desired statistics and improved health outcomes amongst the population.

### CONFLICT OF INTEREST

This study has no conflict of interest to be

declared by any author.

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