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AWARENESS OF FOLIC ACID SUPPLEMENTATION FOR PREVENTING NEURAL TUBE DEFECTS AMONG GYNECOLOGISTS AND PEDIATRIC SURGEONS

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ABSTRACT

Objectives: To assess the level of Awareness of Folic Acid Supplementation for Preventing Neural Tube Defects among Gynecologists and Pediatric Surgeons.

Materials and Methods: This cross-sectional study was conducted in Lady Reading Hospital Peshawar, after approval by the hospital's ethical committee. A total of 50 participants meeting the inclusion criteria were enrolled. Data were collected through a structured, self-administered questionnaire assessing knowledge, awareness, and practices regarding folic acid supplementation, including demographic details, understanding of its preventive role in neural tube defects, and counseling practices. Data analysis was performed using SPSS version 26.

Results: The mean participant age was 47.40±6.97 years, with 46% males and 54% females. Most were aged 41–50 years (48%) and specialized in pediatric surgery (58%), while 82% had over 10 years of experience. Regarding qualification, 70% held FCPS, 20% MCPS, and 10% MBBS/diploma. Overall, 78% demonstrated adequate awareness of folic acid supplementation, and 22% showed inadequate awareness. No significant associations were observed between awareness level and demographic factors such as gender, age, specialty, experience, or qualification ($p > 0.05$).

Conclusion: It was concluded that while most gynecologists and pediatric surgeons were aware of folic acid's preventive role in neural tube defects, notable gaps persisted in their detailed knowledge and counseling practices. Continuous medical education, updated guidelines, and emphasis on preconception counseling are crucial to ensure timely supplementation and reduce neural tube defects in Pakistan.

Key words: Neural Tube Defects, folic acid, awareness.

INTRODUCTION

Neural tube defects (NTDs) are among the most common and severe congenital malformations, resulting from the incomplete closure of the neural tube during early embryonic development.(1) These defects, which include conditions such as spina bifida and anencephaly, contribute

significantly to perinatal morbidity, mortality, and long-term disability worldwide.(2) A substantial body of evidence has established that adequate maternal folic acid intake before conception and during the early weeks of pregnancy plays a crucial role in reducing the risk of NTDs.(3)
Folic acid, a synthetic form of the B-vitamin folate, is essential for DNA synthesis, cell division, and neural development.(4) Studies have shown that daily supplementation with 400 µg of folic acid during the peri-conceptional period can prevent up to 70% of NTDs.(5) Consequently, the World Health Organization (WHO) and numerous international health agencies recommend that all women of reproductive age take folic acid supplements, either through fortified foods or as part of preconception care.(6)
Despite these well-established benefits, global and regional data indicate that awareness and adherence to folic acid supplementation remain suboptimal, particularly in developing countries. This gap is often linked to limited preconception counseling, lack of knowledge among healthcare professionals, and inconsistent implementation of public health policies. Since gynecologists and pediatric surgeons play pivotal roles in maternal and neonatal health, their awareness and counseling practices are critical in ensuring that women receive appropriate advice regarding folic acid intake before and during pregnancy.

Therefore, this study aims to assess the awareness, knowledge, and practices of gynecologists and pediatric surgeons regarding folic acid supplementation for the prevention of neural tube defects. Identifying existing knowledge gaps among healthcare providers can help strengthen educational strategies, enhance preconception counseling, and ultimately reduce the incidence of NTDs in the population.
Objective: To assess the level of Awareness of Folic Acid Supplementation for Preventing Neural Tube Defects among Gynecologists and Pediatric Surgeons.

MATERIALS AND METHODS:

Study Design: Cross sectional study.
Study setting: Lady Reading Hospital Peshawar
Duration of the study: Duration of the study was 6 months (from March 2025 to Sep 2025).
Sampling Technique: Non probability purposive sampling technique was used for the recruitment of patients.
Inclusion Criteria:

- Practicing gynecologists and pediatric surgeons working in public or private tertiary care, teaching, or district hospitals.

Exclusion Criteria:

- Clinicians who were on leave, retired, or not actively practicing during the data collection period.

Methods: This cross-sectional study was conducted after obtaining approval from hospital ethical committee. Total of 50 participants fulfilling the inclusion criteria were enrolled. Data were collected using a structured, self-administered questionnaire designed to evaluate participants' knowledge, awareness, and practices regarding folic acid supplementation. The questionnaire included demographic details such as age, gender, specialty, and years of experience, along with sections assessing understanding of folic acid's role in preventing neural tube defects, awareness of the recommended timing and dosage of supplementation, and counseling practices and attitudes toward patient education. SPSS version 26 was used for the analysis of data.

RESULTS

The mean age of the participants was 47.40±6.97 years. Among them, 23 (46.0%) were males and 27 (54.0%) were females. Regarding age distribution, 8(16.0%) participants were between 30–40 years, 24(48.0%) were between 41–50 years, and 18(36.0%) were between 51–60 years. In terms of specialty, 29(58.0%) were pediatric surgeons, while 21 (42.0%) were gynecologists. Most

participants, 41(82.0%), had more than 10 years of professional experience, followed by 6(12.0%) with 5–10 years and 3(6.0%) with less than 5 years of experience. Concerning qualification, 35(70.0%) held FCPS degrees, 10(20.0%) had MCPS, and 5(10.0%) had MBBS or diploma qualifications. Overall, 39(78.0%) participants demonstrated adequate awareness of folic acid supplementation for the prevention of neural tube defects, while 11 (22.0%) showed inadequate awareness (Table 1).

The association between participants' demographic characteristics and their level of awareness regarding folic acid supplementation was analyzed. Among males, 18(46.2%) demonstrated adequate awareness compared to 5(45.5%) with inadequate awareness, while among females, 21 (53.8%) had adequate and 6(54.5%) had inadequate awareness (p= 0.96). In terms of age, participants aged 30–40 years had 6(15.4%) adequate and 2 (18.2%) inadequate awareness; those aged 41–50 years showed 19(48.7%) adequate and 5(45.5%) inadequate awareness; and those aged 51–60 years had 14(35.9%) adequate and 4(36.4%) inadequate awareness (p=0.97). Regarding specialty, 23(59.0%) pediatric surgeons and 16(41.0%) gynecologists had adequate awareness compared to 6(54.5%) and 5 (45.5%) with inadequate awareness respectively (p = 0.79). Considering years of experience, 2 (5.1%) participants with less than 5 years, 5(12.8%) with 5–10 years, and 32 (82.1%) with more than 10 years of experience had adequate awareness, compared to 1 (9.1%), 1(9.1%), and 9(81.8%) with inadequate awareness (p = 0.85). Regarding qualification, 29(74.4%) FCPS, 7(17.9%) MCPS, and 3(7.7%) MBBS/diploma holders showed adequate awareness, while 6 (54.5%), 3(27.3%), and 2 (18.2%) respectively had inadequate awareness (p= 0.40). No statistically significant association was found between any of the variables and the level of awareness ($p > 0.05$).

Table 1: Baseline demographic characteristics of the participants *(n=50)*

Variables	
Age (Years)	47.40±6.97
Gender	
Male	23(46.0%)
Female	27(54.0%)
Age Groups	
30-40 years	8(16.0%)
41-50 years	24(48.0%)
51-60 years	18(36.0%)
Specialty	
Pediatric surgery	29(58.0%)
Gynecology	21(42.0%)
Years of experience	
<5 years	3(6.0%)
5-10 years	6(12.0%)
>10 years	41(82.0%)
Qualification	
Fcps	35(70.0%)
Mcps	10(20.0%)
Mbbs/diploma	5(10.0%)
Awareness level	
Adequate awareness	39(78.0%)
Inadequate awareness	11(22.0%)

Table 2: Stratification of Awareness level on the basis of demographic characteristics *(n=50)*

Variables	**Awareness level**		
	Adequate awareness	Inadequate awareness	p-Value
Gender			
Male	18(46.2%)	5(45.5%)	0.96
Female	21(53.8%)	6(54.5%)	
Age Groups			
30-40 years	6(15.4%)	2(18.2%)	
41-50 years	19(48.7%)	5(45.5%)	0.97
51-60 years	14(35.9%)	4(36.4%)	
Specialty			
Pediatric surgery	23(59.0%)	6(54.5%)	0.79
Gynecology	16(41.0%)	5(45.5%)	
Years of experience			
<5 years	2(5.1%)	1(9.1%)	
5-10 years	5(12.8%)	1(9.1%)	0.85
>10 years	32(82.1%)	9(81.8%)	
Qualification			
Fcps	29(74.4%)	6(54.5%)	0.40
Mcps	7(17.9%)	3(27.3%)	
Mbbs/diploma	3(7.7%)	2(18.2%)	

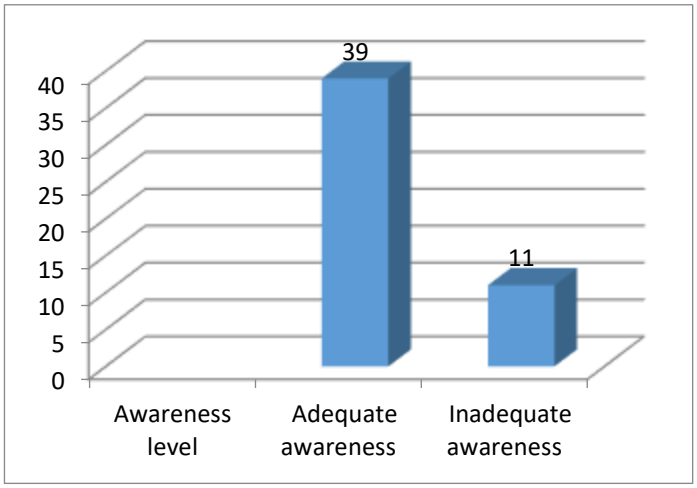

Fig 1: Frequency of participant on the basis of awareness level

DISCUSSION

The present study was conducted to assess the level of Awareness of Folic Acid Supplementation for Preventing Neural Tube Defects among Gynecologists and Pediatric Surgeons. Neural tube defects remain one of the most common congenital malformations worldwide, and extensive evidence demonstrates that periconceptional folic acid supplementation can significantly reduce their incidence. Despite well-established guidelines by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), suboptimal awareness and inconsistent implementation of folic acid supplementation continue to be major public health concerns in many developing countries, including Pakistan.

In this study, the majority of participants (78%) demonstrated adequate awareness about folic acid supplementation in preventing NTDs, while 22% showed inadequate awareness. This finding indicates a relatively satisfactory level of knowledge among healthcare specialists; however, a

considerable gap still exists, particularly given the crucial role these professionals play in maternal and neonatal health education. The results align with the findings of Jennifer L. Williams et al,(7) who reported that although healthcare professionals were generally aware of the importance of folic acid. Another study by AS Anzaku et al.(8) reported that although awareness of folic acid as a vitamin supplement was relatively high among the women surveyed, its actual intake during the periconceptional period remained alarmingly low.

Our findings revealed that awareness levels did not show a statistically significant association with gender, age group, specialty, years of experience, or qualification ($p > 0.05$). This suggests that the level of knowledge regarding folic acid supplementation is relatively uniform across different professional and demographic groups, reflecting that knowledge gaps are widespread rather than confined to specific subgroups. In 1991, the Medical Research Council demonstrated that women who consumed 4000 μg of folic acid daily, without any additional vitamins, had a significantly reduced risk of recurrent neural tube defects (NTDs) compared to those who either did not take folic acid or took a multivitamin complex.(9) Subsequently, in 1992, a Hungarian study by Czeizel et al.(10) found that women who received a multivitamin containing 800 μg of folic acid had a markedly lower risk of a first occurrence of NTDs in their fetuses or infants compared to those who did not take the supplement. However, it remained uncertain whether the protective effect was specifically due to folic acid or other components within the multivitamin preparation.

The mean age of participants in our study was 47.4 years, with most having more than 10 years of professional experience, indicating that the majority were senior clinicians. Despite this, not all demonstrated complete awareness of the recommended preconception timing and daily dose of folic acid, emphasizing the need for continuous professional education. In terms of practice, only about half of the participants reported regularly counseling women of reproductive age regarding folic acid supplementation.

Furthermore, studies from neighboring regions, such as India and Bangladesh, have reported similar results where awareness about folic acid's preventive role is relatively high among healthcare workers, yet the rate of patient counseling and preconceptional use remains low.(11, 12) This indicates a global trend where awareness does not always translate into consistent clinical practice, underscoring the need for structured awareness programs and policy-driven integration of folic acid counseling into routine reproductive healthcare services.

The findings of this study highlight the importance of targeted continuing medical education (CME) sessions and awareness campaigns for both gynecologists and pediatric surgeons. Since these professionals are at the forefront of maternal and child healthcare, strengthening their knowledge and reinforcing counseling practices can significantly improve folic acid uptake among women of childbearing age and subsequently reduce the incidence of neural tube defects.

The study was conducted in selected tertiary care hospitals, which may not represent the awareness levels of healthcare providers working in peripheral or private healthcare settings. Additionally, as the data were based on self-reported questionnaires, there is a possibility of response bias. A larger multicenter study with observational components could provide more generalizable and accurate insights.

CONCLUSION

It was concluded that although most gynecologists and pediatric surgeons were aware of the preventive role of folic acid in neural tube defects, significant gaps still exist in detailed knowledge and consistent counseling practices. There is a strong need for continuous medical education programs, updated national guidelines, and greater emphasis on preconception counseling to ensure that every woman of reproductive age receives proper advice and supplementation at the appropriate time. Enhancing healthcare professionals' awareness and translating it into practice remains essential for reducing the burden of neural tube defects in Pakistan.

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