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EVALUATION OF MATERNAL DIETARY ADEQUACY USING THE FIGO NUTRITION CHECKLIST AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE AT A TERTIARY CARE HOSPITAL IN KARACHI

[1] Dr Salma, [2] Dr Urooj Naz, [3]dr Aneela Habib, [4] Dr Aruna Kumari Hira, [5]dr Joshna, [6] Dr Bushra

[1]department Of Obstetrics & Gynaecology.Postgraduate Trainee Dow University Of Health Sciences. Civil Hospital Karachi, Salmaarisar123@Gmail.Com
[2]department Of Obstetrics & Gynaecology.Assistant Professor Dow University Of Health Sciences. Civil Hospital Karachi, Urooj.Naz@Duhs.Edu.Pk
[3]department Of Obstetrics & Gynaecology. Associate Professor Dow University Of Health Sciences..Civil Hospital Karachi, Aneela.Habib@Duhs.Edu.Pk
[4]department Of Obstetrics & Gynaecology. Assistant Professor Dow University Of Health Sciences. Civil Hospital Karachi, Aruna.Kumari@Duhs.Edu.Pk
[5]department Of Obstetrics & Gynaecology.Post Graduate Trainee, Dow University Of Health Sciences. Civil Hospital Karachi, Joshnak27@Gmail.Com
[6]department Of Obstetrics & Gynaecology.Postgraduate Trainee, Dow University Of Health Sciences. Civil Hospital Karachi, Drbushra14@Yahoo.Com

ABSTRACT

Background: Maternal malnutrition remains a major public health concern, particularly in low- and middle-income countries like Pakistan, where many pregnant women have inadequate dietary intake, leading to adverse maternal and fetal outcomes. The International Federation of Gynecology and Obstetrics (FIGO) Nutritional Checklist is a validated screening tool used during antenatal care to identify nutritional risk and assess dietary adequacy in pregnant women.
Objective: To determine the frequency of adequate dietary intake among pregnant women attending antenatal clinics at a tertiary care hospital in Karachi using the FIGO Nutritional Checklist.
Methodology: This cross-sectional study was conducted at the Department of Gynecology and Obstetrics, Civil Hospital Karachi, from February to August, 2024. A total of 177 pregnant women were enrolled through consecutive sampling. Pregnant women of any gestational age who consented were included, while those with chronic illnesses or high-risk pregnancies were excluded. Data on demographics and obstetric characteristics (parity and trimester) were recorded. Dietary intake was assessed using the FIGO Nutritional Checklist. Data were analyzed using SPSS version 27.0. Quantitative variables were expressed as mean ± standard deviation, while qualitative variables were presented as frequencies and percentages. The chi-square test was applied, with $p \leq 0.05$ considered significant.
Results: The mean maternal age was 32.93 ± 7.49 years and mean BMI was 27.41 ± 2.56 kg/m². Regarding gestational age, 83 (46.9%) women were ≤16 weeks and 94 (53.1%) were >16 weeks. Most participants were multiparous (54.2%) and belonged to urban areas (80.2%). In terms of socioeconomic status, 61.6% had a monthly income >50,000, 65% were unemployed, and 40.7% had primary-level education. Adequate dietary intake was observed in 62 (35%) women, while 115 (65%) had inadequate intake.
Conclusion: A large proportion of pregnant women had inadequate dietary intake. Routine nutritional screening and counseling should be strengthened during antenatal care to improve maternal and fetal outcomes.

KEYWORDS: Pregnancy, Maternal Nutrition, FIGO Nutritional Checklist, Antenatal Care, Dietary Adequacy

INTRODUCTION

A well-balanced diet before and during pregnancy is essential for maternal health and optimal fetal growth and development. Inadequate maternal nutrition is associated with adverse outcomes such as maternal anemia, postpartum complications, and increased neonatal morbidity and mortality [1],[2]. Women of reproductive age in low- and middle-income countries (LMICs), including Pakistan, are particularly vulnerable to nutritional deficiencies due to poor dietary diversity, limited resources, and lack of awareness [3], [4].
Adequate intake of essential nutrients during pregnancy is critical for supporting fetal development and maintaining maternal well-being. However, many pregnant women fail to meet recommended dietary requirements, emphasizing the need for simple and effective tools to assess nutritional status during routine antenatal care [5], [6], [7].

Recognizing the importance of maternal nutrition, the International Federation of Gynecology and Obstetrics (FIGO) developed guidelines on preconception and maternal nutrition and introduced the FIGO Nutrition Checklist [8]. This checklist is a simple, brief, and user-friendly screening tool comprising closed-ended questions to identify nutritional risk and assess dietary adequacy during pregnancy [9]. It can be self-administered or completed with the assistance of healthcare providers during antenatal visits, facilitating early identification of women who may benefit from further dietary assessment and counseling[7].

In Pakistan, particularly in urban settings such as Karachi, there is limited local data on maternal dietary adequacy using standardized tools like the FIGO Nutrition Checklist. Understanding the nutritional status of pregnant women in this context is essential for designing targeted interventions and improving maternal and fetal outcomes [10].

The objective of this study was to determine the frequency of adequate dietary intake among pregnant women attending antenatal visits at a tertiary care hospital in Karachi using the FIGO Nutrition Checklist.

METHODOLOGY

This cross-sectional study was conducted in the Department of Gynecology and Obstetrics, Civil Hospital, Karachi, over a period of six months from February to August, 2024 after the approval of synopsis from Ethical Review Committee of the hospital []. A total of 177 pregnant women aged 20–45 years, with gestational age ≥8 weeks confirmed by dating scan, parity ≥1, singleton pregnancy, and cephalic presentation on ultrasound were included after taking written informed consent. Participants were recruited through non-probability consecutive sampling technique from the antenatal clinic. Patients with history of hypothyroidism and hyperthyroidism, patients with history of malnutrition, celiac disease, inflammatory bowel disease, patients with history of depression and patients with history of connective tissue disorder, vasculitis and autoimmune disease were excluded. The required sample size came out to be 177 patients. By taking frequency of adequate dietary intake from a pilot study to be (8%) **[This pilot study was done on 38 pregnant women, out of which 3 had nutritional inadequacy, therefore no reference is there for citation]**, margin of error =4% and confidence level C.I is 95%. This sample size was calculated using the WHO sample size calculator. Brief history of demographic data was taken.

Nutritional assessment was carried out using the FIGO Nutrition Checklist. The checklist was interviewer-administered by trained healthcare providers during antenatal visits to ensure completeness and consistency of responses. For better understanding, the checklist was explained in the local language (Urdu/Sindhi) where required. Prior to data collection, all healthcare staff involved in the study received brief training sessions on the standardized administration of the checklist to minimize inter-observer variability. Although the FIGO Nutrition Checklist is an internationally validated tool, it was not formally revalidated in the local population; however, it was used in its standard format with necessary language facilitation to ensure participant comprehension.

The FIGO Nutrition Checklist includes 11 items covering general health, dietary practices, and lifestyle behaviors. For this study, **dietary assessment focused specifically on six key components** that reflect overall diet quality: (1) consumption of meat, chicken, or fish; (2) intake of fruits and vegetables; (3) dairy product consumption; (4) whole grains or carbohydrate-rich foods; (5) number of meals per day; and (6) use of packaged or processed snacks.

The FIGO Nutrition Checklist is primarily a **screening tool to identify nutritional risk**, rather than a tool based on a strict numerical score. Therefore, instead of applying a rigid scoring system, dietary adequacy in this study was **operationally defined**: women who met the recommended intake for all six components were classified as having an **adequate diet**, while those who did not meet one or more criteria were categorized as having an inadequate diet. The respondents were required to answer “Yes” or “No.” Each “Yes” response received a score of 1 and each “No” response received a score of 0.

SPSS Version 27 was used to analyze the data. Maternal age, height, weight, and BMI were among the quantitative variables for which mean and standard deviations were computed. For the qualitative variables, such as residency status, parity, gravida, family monthly income, educational status, occupational status, and adequate food intake, frequencies and percentages were computed. To examine the impact of effect modifiers on outcome variables, stratification of maternal age, residency status, parity, family monthly income, educational status, occupational status, and gestational age was used. Chi square tests were used after stratification, however, when the expected frequency in any cell of a contingency table was less than 5, **Fisher’s exact test** was applied instead. A p-value of less than 0.05 was deemed significant.

RESULTS

This study comprised 177 patients who met the inclusion criteria and visited the Department of Gynecology and Obstetrics at the Civil Hospital in Karachi. Among the 177 patients, the minimum age was 20 and the maximum age was 45. Mean maternal age, and BMI was 32.93±7.49 years and 27.41±2.56 kg/m2 respectively. Frequency distribution of gestational age showed that out of 177 patients, 83 (46.9%) and 94 (53.1%) patients were in gestational

age group ≤ 16 and > 16 weeks respectively. 142 (80.2%) were urban resided and 35 (19.8%) were rural resided. Most of the patients had parity > 3 i.e. 96 (54.2%) and 81 (45.8%) had parity ≤. 68 (38.4%) had income ≤ 50000 and 109 (61.6%) had > 50000. 62 (35%) mothers were employed and 115 (65%) were unemployed respectively. Analysis of educational status showed that out of 177 patients, 17 (9.6%), 72 (40.7%), 45 (25.4%) and 43 (24.3%) were in illiterate, primary, secondary and higher respectively, as shown in Table 1.

Table 1: Baseline Data of the Patients

Baseline Data	**(mean ± sd)/n(%)**
Maternal Age (Years)	32.93 ± 7.49
BMI (Kg/m2)	27.41 ± 2.56
Gestational Age (weeks)	
• ≤ 16 weeks • >16 weeks	83 (46.89%) 94 (53.11%)
Parity	
• ≤ 3 • > 3	81 (45.76%) 96 (54.24%)
Residential Status	
• Urban • Rural	142 (82.3%) 35 (19.77%)
Monthly Family Income	
• ≤ Rs. 50,000 • > Rs. 50,000	68 (38.42%) 109 (61.58%)
Occupational status of the mother	
• Working • Non-working	62 (35.03%) 115 (64.97%)
Educational Status of the mother	
• Illiterate • Primary • Secondary • Higher	17 (9.60%) 72 (40.68%) 45 (25.42%) 43 (24.29%)

Out of 177 patients, 62 (35%) and 115 (65%) had and did not have adequate dietary intake, as shown in Figure 1.

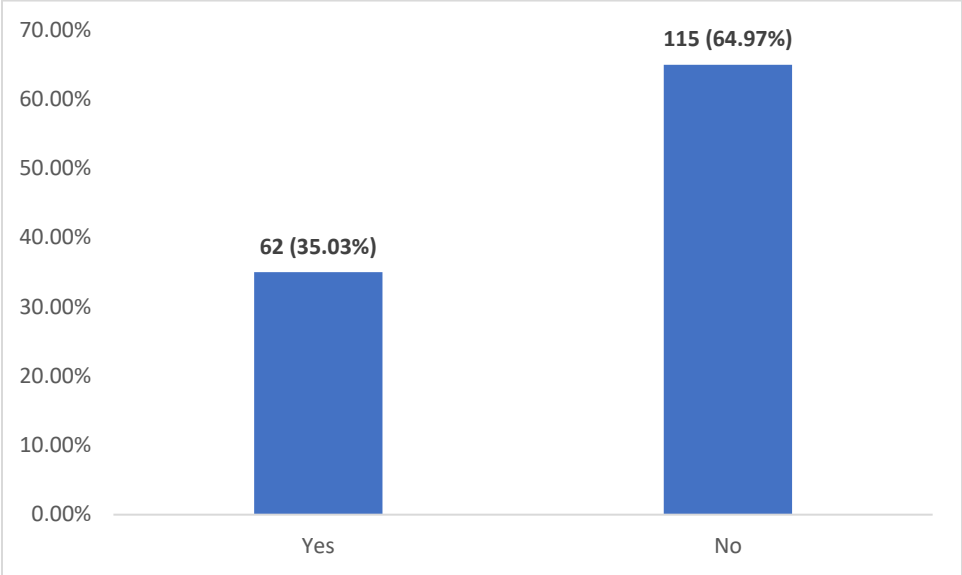

Figure-1 Adequate Dietary Intake Distribution

Age stratification for appropriate food intake revealed that 21 (38.2%) and 41 (33.6%) patients in the 20–30 and 31–45 age groups, respectively, had adequate dietary intake. However, 34 (61.8%) and 81 (66.4%) patients in the 20–30 and 31–45 age groups, respectively, did not consume enough food. P-value was 0.55. Patients with gestational ages ≤ 16 weeks had 26 (31.3%) and 57 (68.7%) sufficient food intake, respectively, according to stratification for gestational age. In contrast, 36 (38.3%) and 58 (61.7%) of the patients with gestational ages greater than 16 weeks had appropriate nutritional consumption, respectively. The P value was 0.33. When resident status was stratified according to adequate dietary intake, 53 (37.3%) and 89 (62.7%) of those who lived in urban areas had adequate dietary intake, respectively. However, 26 (74.3%) and 09 (25.7%) of those who lived in rural areas did not consume enough food, respectively. The P-value was 0.19. In terms of acceptable nutritional intake, stratification for parity revealed that 22 (27.2%) and 59 (72.8%) patients with parity ≤ 3 had and did not have adequate dietary intake, respectively. In contrast, 40 patients (41.7%) and 56 patients (58.3%) with parity > 3 had appropriate nutritional consumption, respectively. P-value was 0.04. In terms of acceptable food intake, stratification by family monthly income revealed that 22 (32.4%) and 46 (67.6%) patients with incomes under $50,000 had adequate dietary intake, respectively. In contrast, 40 patients (36.7%) and 69 patients (63.3%) with incomes over $50,000 had appropriate dietary consumption, respectively. P-value was 0.55. Stratification for occupational status with respect to adequate dietary intake showed that patients who were employed, 14 (22.6%) and 48 (77.4%) had and did not have adequate dietary intake respectively. In contrast, 48 (41.7%) and 67 (58.3%) of the unemployed patients had appropriate dietary consumption, respectively. The P-value was 0.01. Patients in the illiterate, primary, secondary, and higher educated groups had adequate food intake at rates of 12 (70.6%), 17 (23.6%), 16 (35.6%), and 17 (39.5%), respectively. In contrast, patients in the illiterate, elementary, secondary, and higher education groups had acceptable nutritional intake in 05 (29.4%), 55 (76.4%), 29 (64.4%), and 26 (60.5%), respectively. P-value was 0.00, as shown in Table 2.

Table 2: Comparison of frequency of Adequate Dietary Intake with respect to the Baseline Data of the Patients

Baseline Data	**Adequate Dietary Intake**		**P-value**
	Yes	**No**	
Maternal Age (Years)			
• 20-30 • 31-45	21 41	34 81	0.55
Gestational Age (weeks)			

• ≤ 16 weeks • >16 weeks	26 36	57 58	0.33
Parity			
• ≤ 3 • > 3	22 40	59 56	0.04
Residential Status:			
• Urban • Rural	53 9	89 26	0.19
Monthly Family Income			
• ≤ Rs. 50,000 • > Rs. 50,000	22 40	46 69	0.55
Occupational status of the mother			
• Working • Non-working	14 48	48 67	0.01
Educational Status of the mother			
• Illiterate • Primary • Secondary • Higher	12 17 16 17	05 55 29 26	0.01

DISCUSSION:

The current study assessed food quality and nutritional risk factors in Pakistani pregnant women receiving prenatal care using the FIGO nutrition checklist and women are considered to have enough dietary intake if all six of the FIGO checklist's responses are "Yes." According to our research, 65% of the pregnant women did not consume enough food. This nevertheless emphasizes how important it is for pregnant women in Pakistan to undergo rigorous nutritional evaluation.

The evaluation of adequate dietary intake during pregnancy using the FIGO Nutrition Checklist at a tertiary care hospital in Karachi aligns with global evidence highlighting widespread nutritional risks among pregnant women. Studies applying the FIGO checklist in diverse settings reveal that nearly all pregnant women exhibit at least one nutritional risk factor, with a significant proportion showing multiple risks, indicating suboptimal diet quality and potential deficiencies [11, 12]. The checklist's acceptability is high among both pregnant women and healthcare practitioners, who recognize its utility in routine antenatal care despite barriers such as limited time and nutrition training [13]. Nutritional inadequacies identified often include low consumption of whole grains, fish, and micronutrients like folic acid, iron, and calcium, which are critical for maternal and fetal health [14]. Maternal nutrition before and during pregnancy strongly influences risks of pre-eclampsia, gestational diabetes, fetal growth restriction, preterm birth, and longer-term offspring health [15]. Strengthening nutrition interventions integrated into antenatal care services improves dietary diversity and supplement use but still faces challenges in achieving optimal maternal nutrition [16].

Inadequate exposure to sunlight and inadequate eating of fruits, vegetables, and fish were found to be the most important dietary gaps. A diet high in fruits, vegetables, and fish is essential for the growth of offspring as well as the health of the mother [17, 18]. According to the most recent Cochrane systematic review, a lack of the important omega-3 fatty acids found in fish has been linked to preterm delivery, perinatal mortality, and admission to an intensive newborn care unit [19]. In a similar vein, insufficient consumption of fruits and vegetables during pregnancy raises the risk of low birth weight and shorter neonatal length, as well as GDM and hypertensive diseases [20].

CONCLUSION:

According to the FIGO Nutrition Checklist indications, the results indicate that some pregnant women are suffering from nutritional abnormalities and that their nutritional needs are not being addressed. To guarantee that pregnant women receive enough nourishment during their pregnancy, it is advised that prenatal care include nutrition instruction. The current study's findings also demonstrated that the FIGO nutrition checklist can be used in our healthcare environment.

CONFLICT OF INTEREST: NIL
FINANCIAL ASSISTANCE: NIL