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# Assessing the Diet Quality and Nutritional Risk of Pregnant Women in a Tertiary Care Hospital Based on FIGO Nutritional Checklist: A Cross-Sectional Study

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## ABSTRACT

**Background**: The FIGO (International Federation of Gynaecology and Obstetrics) Nutrition Checklist for Antenatal Care offers evidence-based recommendations to guide healthcare providers and patients in maintaining optimal nutrition throughout pregnancy.

**Materials and Method**: Observational cross-sectional study conducted over 3 months at Sree Balaji Medical College, Chennai, among 215 pregnant women

**Results**: Mean gestational age was 21.6 (SD 7.65) weeks, and mean maternal age was 26.15 (SD 5.98) years. Significant associations were found between FIGO diet standards for fish intake, dairy product intake, whole grain intake, and folic acid intake with hemoglobin levels ($p<0.05$).

**Conclusion**: The FIGO Nutrition Checklist provides a quick and cost-effective intervention to help healthcare providers manage pregnant women's nutrition, supporting the health of women and future generations.

***Keywords:*** *Diet quality, Nutritional risk, Pregnant women, FIGO Nutritional Checklist.*

## 1. INTRODUCTION

Pregnancy is a critical period for optimizing maternal and fetal health through nutrition, yet dietary inadequacies remain a global public health challenge. Suboptimal maternal nutrition is strongly associated with adverse outcomes, including anemia, excessive gestational weight gain (GWG), preterm birth, and increased risk of non-communicable diseases (NCDs) such as diabetes and hypertension in both mother and child [1,2]. The FIGO Nutrition Checklist offers a structured, evidence-based tool to evaluate diet quality and identify nutritional risks during pregnancy, enabling tailored interventions [3]. Its application in diverse clinical settings, particularly in low- and middle-income countries (LMICs) like India, is underexplored.

Globally, adherence to dietary checklists among pregnant women is poor. A cohort study in the Netherlands found only 22% met recommended fruit and vegetable intake, with deficits in fish and whole grains [4]. In India, the triple burden of malnutrition—undernutrition, overnutrition, and micronutrient deficiencies—is driven by socioeconomic disparities and dietary transitions [5]. A study in rural Maharashtra reported 62% of pregnant women had inadequate iron intake, contributing to a 50% anemia prevalence [6]. A South Indian study noted low folate and vitamin D intake, linked to neural tube defects and maternal morbidity [7].

Nutritional counseling during pregnancy shows promise. An RCT in Ethiopia found structured dietary advice improved hemoglobin levels and reduced low birth weight by 28% [8]. Another RCT in the US showed counseling on the DASH diet lowered maternal blood pressure and GWG [9]. However, barriers like limited provider training, low preconception care uptake, and cultural dietary preferences impede progress [10]. In India, only 30% of women receive adequate antenatal nutritional guidance due to resource constraints [11]. The FIGO Nutrition Checklist addresses these gaps by offering a quick, standardized method to assess dietary habits and facilitate discussions in busy clinical settings.

This study evaluates the FIGO Nutrition Checklist's utility in a tertiary care hospital in Chennai, India, among 215 pregnant women. We aimed to assess diet quality, nutritional risk, associations with hemoglobin levels, and quality-of-life indicators like dyspnea. By comparing findings with global and regional data, we contribute to the evidence base for integrating this tool into routine antenatal care in resource-limited settings.

## 2. MATERIALS AND METHOD

This observational cross-sectional study was conducted at the Obstetrics and Gynecology OPD of Sree Balaji Medical College, Chennai, over 3 months among 215 pregnant women.

### Sample Size

Assuming 50% adherence to the FIGO Checklist based on prior studies (ranging from 30% to 70%), a sample size of 215 was calculated using Dobson's formula.

**Inclusion Criteria**: Adult pregnant women (≥18 years), willing to participate, at any stage of pregnancy.

**Exclusion Criteria**: Women <18 years, unable to provide informed consent, with severe pre-existing conditions (e.g., chronic renal disease, uncontrolled diabetes), multiple pregnancies, or known allergies/contraindications to recommended nutrients/supplements.

### Operational Definition

The FIGO Nutrition Checklist provides evidence-based recommendations for optimal nutrition during pregnancy, emphasizing a balanced diet with adequate folate, iron, calcium, and vitamin D. It encourages diverse food groups (fruits, vegetables, proteins, whole grains), hydration, weight management, and micronutrient supplementation when needed.

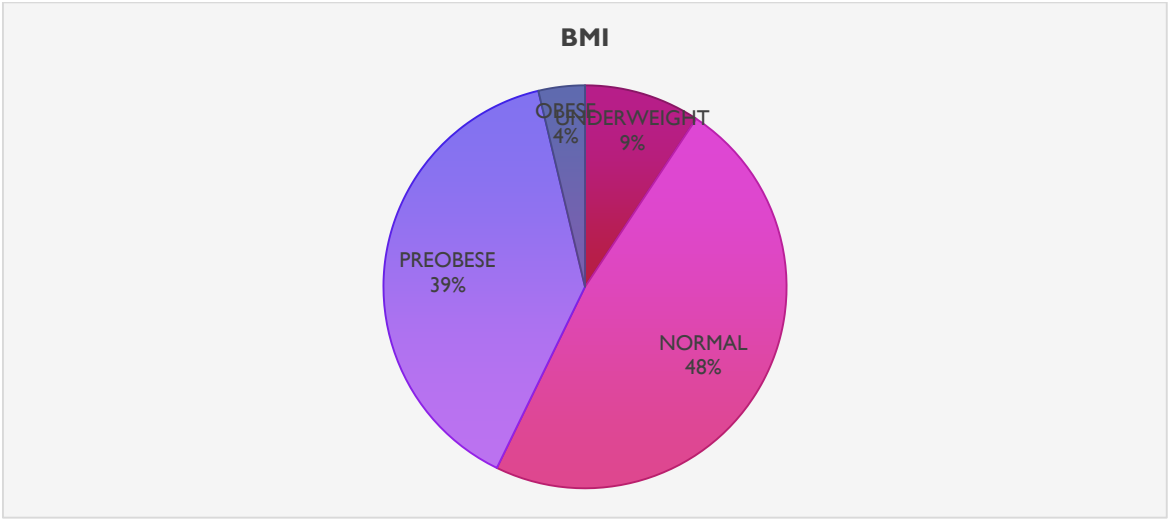
**Table 1: Demographic Information of the participants (N=215)**

| | MATERNAL AGE | GESTATIONAL AGE | GWG |
|---|---|---|---|
| **Mean** | 26.15 | 21.6 | 10.3 |
| **Std. Deviation** | 5.98 | 7.65 | 1.79 |
| **Minimum** | 19 | 12 | 4 |
| **Maximum** | 43 | 33 | 19 |

### Data Collection and Management

Data were collected using the FIGO Nutrition Checklist Questionnaire administered to 215 pregnant women. Variables included maternal age, parity, marital status, education, income, pregnancy characteristics (trimester, gravidity), anthropometric indices (weight, height, pre-pregnancy BMI, GWG), hemoglobin concentrations, and quality-of-life measures like dyspnea. The checklist assessed four domains: special dietary needs, GWG, diet quality, and need for supplementation, with dyspnea evaluated as a potential outcome related to nutrition.

**Figure 1: BMI of study participants (N=215)**



**Anthropometric Indices**

Body weight and height were measured, and pre-gravid weight was reported to calculate pre-pregnancy BMI. GWG was determined based on pre-gravid BMI.

**Hemoglobin Concentrations**

Hemoglobin levels were assessed to explore correlations with diet quality. A "Test One" component included a binary question on the presence and age of children, analyzed alongside FIGO-Diet Quality Score (0-6, based on six dietary questions) and FIGO-NRS Score (0-9, based on six dietary and three supplementation questions).

**Scoring**

- **FIGO-Diet Quality Score**: Six dietary intake questions, each positive response (YES) scored 1, negative (NO) scored 0 (range 0-6; higher indicates better quality).
- **FIGO-NRS Score**: Six dietary questions plus three supplementation questions (range 0-9; lower indicates higher risk).

**Table – 2 Self reported diet standards (N=215)**

| Variables | Self reported diet standard Yes n (%) | | p value |
|---|---|---|---|
| Meat or chicken 2-3 times a week | 150 | 69.77 | 0.695 |
| Fruits or vegetables 2-3 times a day | 124 | 57.67 | 0.672 |
| Fish 1-2 times a week | 142 | 66.05 | 0.001 |
| Diary products everyday | 146 | 67.91 | 0.001 |
| Wholegrain carbohydrate atleast once a day | 146 | 67.91 | 0.001 |
| Packaged snack less than 5 times a week | 170 | 79.07 | 0.127 |

**Table 3: FIGO Self reported diet standard questionnaire (N=215)**

| Answered Yes to all 6 questions | Frequency | % | p |
|---|---|---|---|
| **No** | **196** | **91.16%** | **0.605** |
| **Yes** | **19** | **8.84%** | |
| **Total** | **215** | **100%** | |
| **Invalid** | **0** | **0%** | |
| **Total** | **215** | **100%** | |

**Figure 2: FIGO Self reported diet standard questionnaire (N=215)**

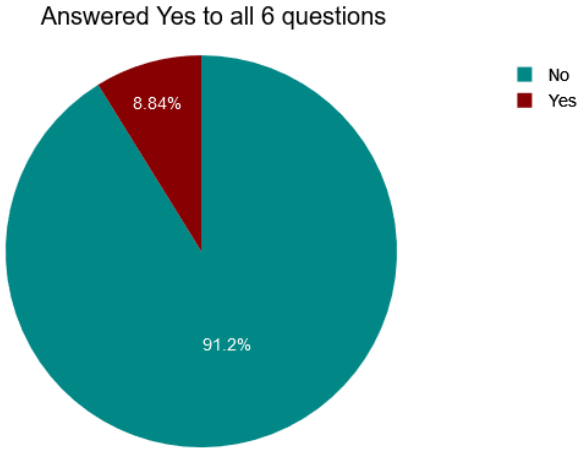
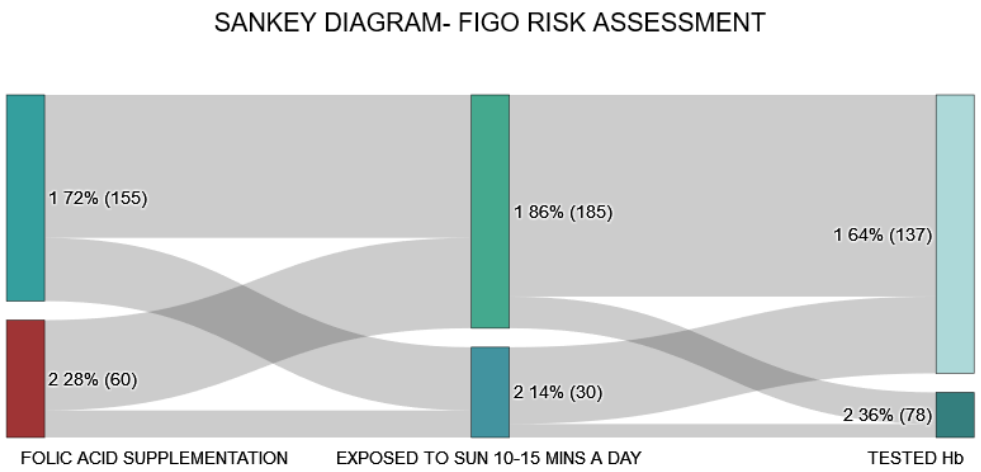


**Table 4: Nutritional risk questions (N=215)**

| Variables | Nutritional risk score<br>n (%) | p value |
|---|---|---|
| **Folic acid intake** | **155 (72)** | **0.002** |
| **Exposure to sun** | **185 (86.05)** | **0.108** |
| **Tested Hb** | **137 (64)** | **0.459** |
| **Hb (normal)** | **124 (57.67)** | **0.459** |

**Figure 3: Sankey diagram- FIGO Risk assessment (N=215)**




**Analysis and Follow-Up**

Data were analyzed to evaluate the Checklist's effectiveness in identifying diet quality and nutritional risk. Statistical methods assessed associations across variables.

**Ethical Issues**

Ethical approval was obtained from the Institutional Review Board. Informed consent was secured, emphasizing voluntary participation and the right to withdraw. Confidentiality was maintained, and data were anonymized.

## 3. RESULTS

The study, conducted from March to May 2025 at Sree Balaji Medical College, assessed 215 pregnant women using the FIGO Nutrition Checklist. Mean maternal age was 26.15 years (SD 5.98), mean gestational age was 21.6 weeks (SD 7.65), and mean GWG was 10.3 kg (SD 1.79).

Regarding BMI, 48% (103 women) were normal, and 39% (84 women) were pre-obese. Diet quality showed 66% (142 women) consumed fish 1-2 times/week, 68% (146 women) had daily dairy, and 68% (146 women) ate whole grains daily, all significantly associated with better hemoglobin levels (p=0.001). Fruit and vegetable intake was lower, with 58% (124 women) consuming them 2-3 times/day, showing no significant association (p=0.672).

The mean FIGO-Diet Quality Score was 4.2 (SD 1.3), with only 8.84% (19 women) achieving the maximum score of 6. The mean FIGO-NRS Score was 5.8 (SD 1.9). Folic acid supplementation (72%, 155 women) was significantly associated with hemoglobin levels (p=0.002). Sun exposure was reported by 86% (185 women) but showed no significant effect (p=0.108).

Dyspnea was reported by 21% (45 women), with lower diet quality scores (3.5 vs. 4.5, p=0.03). Nearly half (46%, 98 women) had children, with the youngest averaging 3.2 years (SD 1.8). Women with children under 2 had slightly lower NRS scores (5.4 vs. 6.0, p=0.08), possibly due to caregiving demands.

## 4. DISCUSSION

This study provides insights into the FIGO Nutrition Checklist's utility among 215 pregnant women. The mean FIGO-Diet Quality Score of 4.2 indicates moderate adherence, consistent with a UK study where 80% failed to meet at least one dietary recommendation [13]. Significant associations between fish, dairy, and whole grain intake and hemoglobin levels (p=0.001) align with a Norwegian cohort linking fish consumption to a 15% lower anemia risk [14] and a meta-analysis confirming dairy's role in hematopoiesis [15]. These findings suggest targeting these food groups could address India's high anemia prevalence (>50%) [6].

Low fruit and vegetable intake (57.67%) mirrors global trends, with a Brazilian study reporting only 30% adequacy, linked to poorer GWG control [16]. Higher whole grain intake (67.91%) contrasts with a Spanish study (45%), where low intake was tied to glycemic issues [17]. Dyspnea (20.9%), associated with lower diet quality (p=0.03), suggests a link to anemia or nutrient deficits, potentially vitamin D, common in India despite 86% sun exposure [19]. Longitudinal studies with biomarkers are needed.

Women with young children (45.6%) trended toward higher nutritional risk (p=0.08), possibly due to caregiving, consistent with a Canadian study [20]. The Checklist's simplicity supports its use in resource-limited settings, where nutritional care is often inadequate.

Limitations include self-reported data (potential recall bias, as noted in an Australian study [23]) and the cross-sectional design, which limits causality assessment compared to a longitudinal Italian study [24]. Lack of biochemical markers (e.g., ferritin) contrasts with a Chinese study linking low FIGO scores to iron deficiency [25]. Despite this, the Checklist's effectiveness supports its integration into India's antenatal care.

Mean GWG (10.3 kg) aligns with Indian norms but exceeds Japanese findings (7-9 kg) [26]. The Checklist's utility in busy settings mirrors a multicountry trial [27]. Future research should explore longitudinal impacts, biomarkers, and cultural influences.

## 5. CONCLUSION

The FIGO Nutrition Checklist effectively identifies nutritional gaps among pregnant women, with most reporting habits posing risks. It offers a quick, cost-effective tool for healthcare providers to address maternal nutrition, adaptable across diverse settings, supporting women's and future generations' health.

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