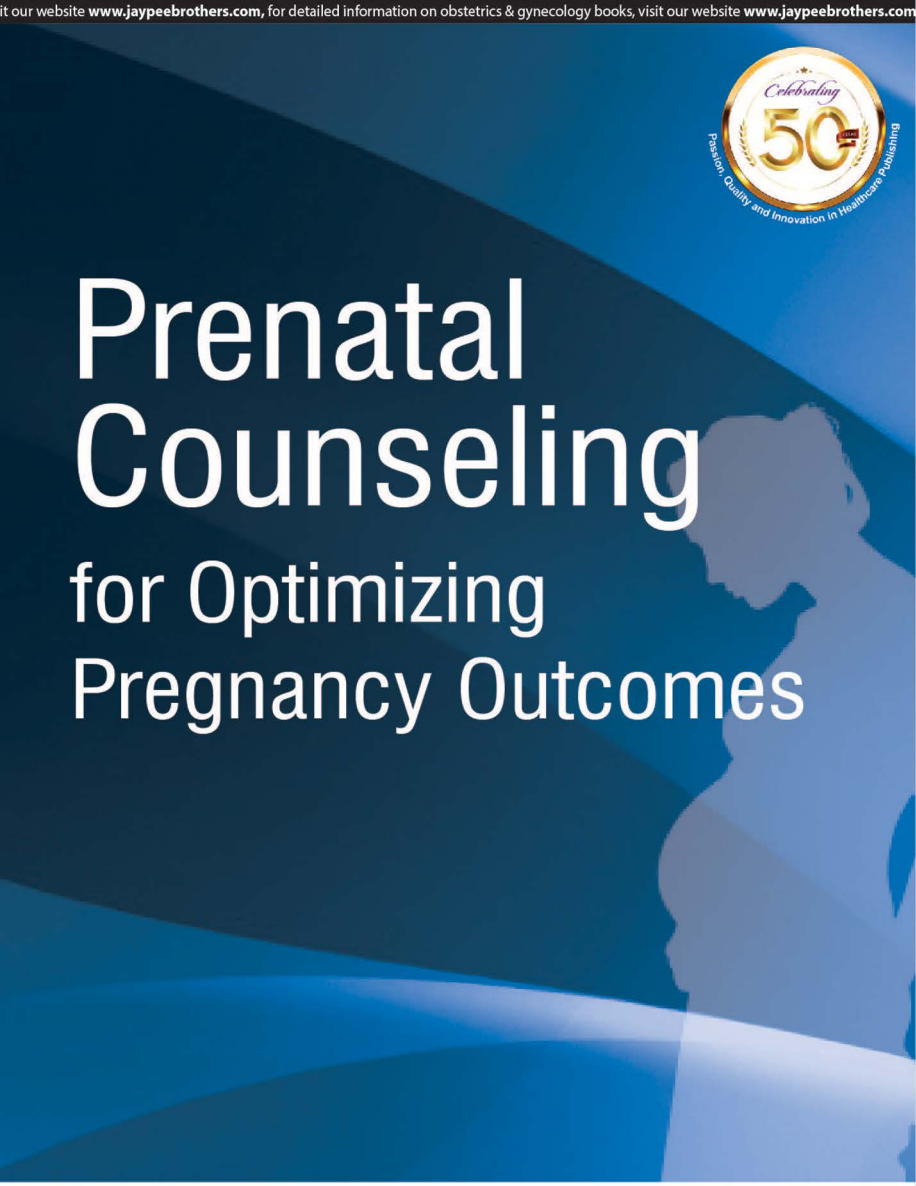
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Prenatal Counseling

for Optimizing Pregnancy Outcomes



Editor
Ashok Kumar

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CHAPTER

4

Counseling for Nutrition during Pregnancy

Alka Mohan Chutani

INTRODUCTION

Nutrition is a basic requirement to a healthy life. A balanced diet is important at every stage of life for proper growth and development. Pregnancy is a nutritionally demanding period of growth with number of changes occurring (physiologic, anatomical, and biochemical changes). It is well established that adequate nutrition before and during pregnancy affects the long-term health of the infant and the mother. A malnourished (underweight or overweight) pregnant woman is at risk of complications for herself and the baby. During the prepregnancy stage, it is important to achieve normal weight to decrease the complications during pregnancy. Thus, it is important to focus on health before conceiving.

During pregnancy, the nutritional requirements are varied and emphasis is especially for appropriate weight gain. Recommended weight gain during pregnancy is dependent on the prepregnancy weight and body mass index (BMI). Women who are undernourished at the beginning of pregnancy are at higher risk of disease and death for themselves and for the baby (Table 1).[1,2]

PHASES OF PREGNANCY

Pregnancy can be divided into three main phases:[3,4]

1. Implantation (first 2 weeks of gestation)
2. *Organogenesis (next 6 weeks of gestation)*: Various animal studies have shown this to be a critical period

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TABLE 1: Weight gain recommendation for pregnancy.[2]

Prepregnancy weight status	*Body mass index (BMI)*	*Recommended weight gain*	*Recommended weight gain in 2nd and 3rd trimester (kg/week)*
Underweight	<18.5	12.7–18.1	0.45
Normal	18.5–24.9	11.3–15.9	0.45
Overweight	25–29.9	6.8–11.3	0.36
Obese	>30	5–9	0.22

for development of various tissues. Critical period for development of neural tube is from day 17 to day 30 of pregnancy. Adequate intake of folate is recommended before and during first 3 months as it is important for prevention from neural tube defects.

3. *Growth (remaining 7 months of pregnancy)*: This takes place in three steps:
   i. Hyperplasia (requires adequate supply of folate and vitamin B_{12})
   ii. Cell replication with hypertrophy (requires adequate amount of amino acids and vitamin B_6)
   iii. Cellular growth.

FOOD INTAKE DURING PREGNANCY

Nutritional requirement during pregnancy is increased especially for total calories, proteins, and some other nutrients (Table 2).[5]

Focus on following nutrients:

- The daily food intake of a pregnant woman should contain additional 350 calories, 0.5–0.6 g of protein during first trimester, 6.9–8.1 g of protein during second trimester, and 22.7–27 g protein during last trimester of pregnancy.[6]
- Few micronutrients like zinc, iron, and some vitamins are needed in increased amounts during this phase.

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TABLE 2: Daily recommended dietary allowance (RDA) for energy, protein, fat, and some nutrients for normal (of 55 kg body weight) and pregnant women (RDA, ICMR 2011).[5]

Category	*Energy (kcal/ day)*	*Protein (g)*	*Visible fat (g)*	*Calcium (mg)*	*Iron (mg)*	*Vitamin A µg (Retinol/β carotene)*	*Ascorbic acid (mg)*	*Folate (µg)*	*Vitamin B_{12} (µg)*
Sedentary worker	1,900	55	20	60	21	600/4,800	40	200	1.0
Moderate worker	2,230	55	25	600	21	600/4,800	40	200	1.0
Heavy worker	2,850	55	30	600	21	600/4,800	40	200	1.0
Pregnant women	+350	+23 = 78	30	1200	35	800/6,400	60	500	1.2

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- Folic acid, taken prior to and during pregnancy, decreases the risk for congenital malformations.
- The fetus and the pregnant lady requires higher iron intake due to demands of erythropoiesis (RBC formation). Good food sources of iron[6] are:
  - *Cereal grains and millets*: Bajra, ragi, and rice flakes.
  - *Green leafy vegetables*: Spinach, turnip greens, mustard greens, fenugreek leaves, Colocasia leaves, etc.
  - *Pulses*: Soya beans, roasted chana, and sprouted pulses.
  - Oil seeds, Niger seeds (black til), and watermelon seeds.
  - Dried fruits, such as raisins, prunes, dates, and apricots.
  - *Nonvegetarian sources*: Liver, lean red meats, including pork, lamb, seafood, such as oysters, Clams, tuna, salmon, and shrimp, etc.
  - Chicken and egg yolks.
- Calcium is an important nutrient during pregnancy for the formation of bones and teeth of the baby and prevention of osteoporosis in the pregnant woman. Good food sources of calcium include dairy products, leafy green vegetables, certain fish, grains, and legumes.
- Adequate iodine intake ensures proper mental health of the growing fetus and infant.
- Additional vitamin A is needed during pregnancy.

FEEDING PATTERN

A balanced diet providing nutrients in right proportion should be taken by the pregnant women. In addition, some physical activity as advised by the doctor along with rest is also recommended.

During the first trimester, if the woman is suffering from nausea and vomiting some precautions can help reduce the symptoms, like:

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- On rising in the morning, intake of biscuit or toast with jam or honey may help.
- Small and frequent meals which are low in spices and fats should be taken.
- Avoid foods with specific smell which may trigger nausea.
- Have adequate fluid intake to prevent dehydration.

During second and third trimester:

- Small and frequent meals like three major meals (breakfast, lunch, dinner) along with three minor meals providing nutritious snacks (mid-morning, tea, bedtime).
- Adequate protein intake by incorporating protein-rich sources like milk and milk products, pulses, and legumes, meat, and eggs.
- Intake of adequate fluid along with adequate fiber to prevent constipation.
- It is recommended to have variety in the meals by having different food items along with different kinds of vegetables (Green leafy vegetable, roots and tubers, other vegetables) and seasonal fruits.

During pregnancy, emphasis is on a balanced diet containing all food items in adequate quantities—diet diversity. For example, a plate should contain, cereals—one-third portion of the plate; one-third portion of vegetables (seasonal and green leafy); one-third portion of pulses/meat; 2–3 servings of milk and 1 serving of seasonal fruits along with adequate amounts of oil and sugar.

An individualized diet plan should be provided to the woman based on her requirement choices and economic status and her lifestyle.

In addition to nutrition, the pregnant ladies should also be counseled on avoidance of alcohol and smoking and on personal and food hygiene as these all would also impact the growth and development of the baby.

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KEY POINTS

- Pregnancy is a nutritionally demanding phase of life.
- A balanced nutrition before and during pregnancy contributes to health of mother and infants.
- Achievement of normal weight during prepregnancy period decreases complications during pregnancy.
- A pregnant woman should have additional 350 calories with protein, micronutrients and folic acid.

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Prenatal Counseling

for Optimizing Pregnancy Outcomes

Salient Features

- In present age scenario, counseling of patients is extremely important, given the surge in medicolegal cases
- Describes the various components of counseling and methods of providing counseling to patients
- Provides insight on how to counsel in diverse patients including adolescents, young girls, healthy pregnant women, patients with chronic medical conditions such as hypertension, diabetes, asthma, etc.
- Includes chapters on preconceptional counseling to patients with genetic disorders, premarital counseling to patients with thalassemia and other hemoglobinopathies, counseling about fertility preservation in cancer patients and preconceptional counseling for cancer survivors, etc.
- This book is a must have for all obstetrics and gynecology practitioners.

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