

# Next Pregnancy and Nutritional Challenges

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**Abstract:** Every pregnancy has its risks. When certain medical conditions arise before or during pregnancy, more careful monitoring is needed. **Objectives:** The purpose of this study to determined the prevalence of nutritional challenges in the next pregnancy. According to the lack of information available on consequence of next pregnancy on the mother health and the outcome of the pregnancy at Hail/KSA, the present study was designed to collect information from woman who experience with next pregnancy. **Material and Method:** 105 questionnaires were submitted to collected information at University of Hail/ college of Applied Science. 105 female experience next pregnancy, were interview to collect information related to their socioeconomic status, age, dietary intake, problems facing women after the next pregnancy. In addition, self reported weight and height was collected. **Result:** The general characteristics of the population, educated to university level and work 56.5%, with high economic status 60.2. There are nutrition challenges 66%. With high BMI 40%, which indicate over weight between the studied groups, there is significant relationship between mean age of study group and Body Mass Index (p-value 0.027). There is significant relationship between nutritional challenges in pregnancy and number of deliveries (p-value 0.0274). There is significant relationship between nutritional challenges in pregnancy and occupation (p-value 0.038). **Conclusion:** There are nutritional challenges facing women at Hail community. Nutrition education should be carry at Hail community to reduce of nutrition challenges facing women during pregnancy.

**Keyword:** pregnancy, nutrition, challenges, BMI, health, Delivery, Hail

## 1. Introduction

Approximately 10 % of all pregnancies are considered "high risk," meaning a maternal preexisting complication or a situation that presents in the gestation that puts the fetus at risk for in utero injury or premature delivery and subsequent morbidity (1).

It is often after 4 weeks of gestation that a woman learns she is pregnant, which corresponds to 2 weeks after a missed menses. Pregnancy is counted from the first day of the last menstrual cycle. Maternal nutritional status has been evaluated primarily for infant birth weight, risk of neural tube defects (NTDs), and fetal alcohol syndrome. Birth weight is highly correlated with infant mortality and morbidity. Newborns born small for gestational age (SGA) are at increased risk for long-term health adversity such as hypertension, obesity, glucose intolerance, and cardiovascular disease. Besides a woman's dietary intake, other factors such as air quality and purity of water can contribute adversely to a pregnancy (2).

### 1.1 Nutritional Requirements

Fetal growth and pregnancy demand additional nutrients, and these requirements are defined in the new dietary reference intakes (DRIs), which include adequate intakes (AIs) and RDA (3)

### 1.2 Energy

Additional energy is required during pregnancy to support the metabolic demands of pregnancy and fetal growth. Metabolism increases by 15% in pregnancy. The 2002 DRIs for energy for the pregnant female are the same as for the non-pregnant female in the first trimester but then increase an additional 340 to 360 kcal/day during the second trimester and another 112 kcal/day in the third trimester. (4)

If maternal weight gain is within the desirable limits, the range of acceptable energy intakes varies widely, given individual differences in energy output and basal metabolic rate.

Energy expended in voluntary physical activity is the largest variable in overall energy expenditure' Physical activity increases energy expenditure proportional to body weight. However, most pregnant women compensate to increased weight gain by slowing work pace; thus total daily energy expenditure may not be substantially greater than before pregnancy. Excessive exercise, combined with inadequate energy intake, may lead to suboptimal maternal weight gain and poor fetal growth; therefore a pregnant woman should always discuss exercise with her primary health practitioner. (5)

Acute insults at early gestation, resulting in rapid drop in oxygen delivery to the fetal brain at a time when neurogenesis and neural migration are at their peak, can result in the death of neurons, including Purkinje cells in the cerebellum pyramidal cells in the hippocampus and cortical neurons, and a slowing of neural mitigation, at least in the hippocampus. (6)

Exercising during pregnancy at high altitudes may compromise fetal oxygen delivery. Resting uterine blood flow is lower in residents reside at 3100 m than at 1600 m. and blood flow is likely to decrease further during exercise in proportion to the intensity and duration. A more conservative stance regarding exercise at elevations over 1600 m during pregnancy may need consideration. (7).

### 1.3 Protein

There is an additional protein requirement for a pregnant woman to support the synthesis of maternal and fetal tissues.

Protein requirement increases throughout gestation and is maximum during the third trimester. The current RDA of 0.66 g/kg/day of protein for pregnant women are the same as that for the non-pregnant women in the first half of pregnancy and increases for the second half to 71 g/day.

Protein deficiency during pregnancy has adverse consequences, but limited intakes of protein and energy usually occur together, making it difficult to separate the effects of energy deficiency from those of protein deficiency. Providing extra energy to a pregnant woman influences pregnancy outcome equal to that of providing both energy and protein. Thus it appears that an energy deficit rather than a protein deficit determines an unfavorable pregnancy outcome. (8).

#### **1.4 Carbohydrates**

DRIs for carbohydrates in pregnancy are presented. The estimated average requirement (EAR) is 135 g/day, and the AI is 175 g/day (4). This 135 to 175g /day is the recommended amount to provide enough calories in the diet to prevent ketosis and maintain appropriate blood glucose during pregnancy. This 175grams translates to 700 calories and is 35% of an average 2000 calorie/day regime. Careful choices are needed to include all the nutrients for pregnancy in the daily diet.

Daily consumption of whole-grain, breads and cereals, leaf green and yellow vegetables, and fresh and dried fruits should be encouraged to provide additional minerals, vitamins, and fiber. The DRI for fiber during pregnancy is 28 g/day Careful attention to the selection of foods that are also good sources of iron and folic acid is important. (9)

#### **1.5 Lipids**

There is no DRI for lipids during pregnancy. The amount of fat in the diet should depend on energy requirements for proper weight gain. However for the first time there is a recommendation (an AI of 13 g/day) for the amount of n-6 polyunsaturated fatty acids (linoleic acid) and an AI of 1.4 g/day for the amount of n-3 polyunsaturated fatty acids in the diet.(9)

#### **1.6 Vitamins**

Certain vitamins have particular significance for optimal pregnancy outcome. In some instances the provision of these specific vitamins may be met through diet, and for others a vitamin-mineral supplement is necessary. Periconceptional multivitamin supplementation has been documented to reduce the risk of heart defects in infants by 43% if started very early in pregnancy (10)

Folic Acid.. Folic acid requirements increase during pregnancy in response to the demands of maternal erythropoiesis and fetal and placental growth and, most important, for the prevention of NTDs. The RDA for folic acid in pregnancy is 600 mcg, a 200 mcg increase over that for non-pregnant females. The IOM recommends that 400 mcg of the 600 mcg/day be provided by folate-fortified foods or supplements because it is better absorbed, with 200

mcg from food and beverages. A tolerable upper intake level (UL) is 800 to 1000 mcg/day from fortified foods or supplements. (11) (12).

Folic acid deficiency is marked by a reduced rate of deoxyribonucleic acid (DNA) synthesis and mitotic activity in individual cells. Megaloblastic anemia is the latest stage of folate deficiency, and it may not present until the third trimester; however, white cell morphologic and biochemical changes signaling deficiency may precede overt anemia (In experimental animals maternal folate deficiency is associated with an increased incidence of congenital malformations. Malformations can also occur in infants of women using folate antagonist drugs such as the anticonvulsant medications phenytoin (dilatant), carbamazepine, and diphenylhydantoin. Oral contraceptives and some antibiotics (trimethoprim, triamterene, and carbamazepine) may also cause folate insufficiency (13).

#### **1.7 Common High-Risk Conditions**

##### **1.7.1 Gestational Diabetes**

Some pregnant women have trouble controlling their blood sugar, often due to gestational diabetes. Blood sugar (glucose) provides energy for the body. The amount of "sugar" in your blood is kept in a normal range by insulin.. Gestational diabetes usually starts in the latter half of the second trimester. This condition requires closer monitoring before and during pregnancy. The closer blood sugar levels are to the normal range, the better the health of both mom and baby. This also reduces the possibility of giving birth to a large baby – which can be a problem with vaginal delivery.(14)

##### **1.7.2 Pre-eclampsia**

Pre-eclampsia can develop during the second half of pregnancy, most cases usually occur at or near the end of pregnancy or just after birth. Other terms used to describe pre-eclampsia are toxemia, or pregnancy induced hypertension. Pre-eclampsia causes blood vessels to constrict (get smaller) which makes it harder for the mother's blood flow to support the fetus. The only cure is delivery of the baby.(15). Globally 70,000 women and 500,000 babies die every year as a direct result of pre-eclampsia. For the mother, it can lead to acute problems in the liver, kidneys, brain and the clotting system, and pre-eclampsia is the most important cause of maternal death.

##### **1.7.3 Vaginal Bleeding Later in Pregnancy**

The placenta is the link to the mother's blood supply; it is important in providing nourishment to the fetus. Problems with the placenta occur in less than 1% of all pregnancies. In late pregnancy, vaginal bleeding may be a sign that something is wrong with the way the placenta is attached to the lining of the uterus.( (16)

##### **1.7.4 Fetal Growth Restriction**

Is usually due to placental problems leading to inadequate nutrition of the baby and overall affects 1 in 10 pregnancies. The time interval between one pregnancy and the next may affect the risk of pregnancy complications. Both short and long interpregnancy intervals have been

associated with adverse outcome, but the bulk of adverse effects have been associated with short intervals (17) Whether the interpregnancy interval is a significant independent biological risk factor for adverse pregnancy events is important because women have some control over the spacing of their pregnancies and thus could potentially reduce their risk of adverse outcomes. Avoidance of short intervals can be achieved through postpartum provision of contraception, but avoidance of long interpregnancy intervals is more problematic since a desired pregnancy may be precluded by sub fertility, availability of a partner, economic issues, or illness (18)

### 1.7.5 Anemia & Pregnancy

Your body goes through significant changes when you become pregnant. The amount of blood in your body increases by about 20-30 percent, which increases the supply of iron and vitamins that the body needs to make hemoglobin. Hemoglobin is the protein in red blood cells that carries oxygen to other cells in your body.

Many women lack the sufficient amount of iron needed for the second and third trimesters. When your body needs more iron than it has available, you can become anemic.

Mild anemia is normal during pregnancy due to an increase in blood volume. More severe anemia, however, can put your baby at higher risk for anemia later in infancy. In addition, if you are significantly anemic during your first two trimesters, you are at greater risk for having a pre-term delivery or low-birth-weight baby. Being anemic also burdens the mother by increasing the risk of blood loss during labor and making it more difficult to fight infections.(19).

## 2. Study objective

The main objective of this study to determined the prevalence of nutritional challenges in next pregnancy. According to the lack of information available on consequence of the next pregnancy on the mother health and the outcome of the pregnancy at Hail/KSA, the present study was designed to collect information from woman who experience with more than two deliveries.

## 3. Materials and Methods

### 3.1 Sample Population

105 female were interview to collect information at University of Hail/KSA from women who experience next pregnancy

### 3.2 Data Collection and study group Interviews

Women were interviewed by the researcher using the designed questionnaire. The study procedure and goals were explained to women. Designed questionnaire includes information related to socioeconomic status, age, dietary intake, problems facing women after the second delivery In addition; self reported weight and height was collected.

## 4. Result & Discussion

### 4.1 Result

**Table 1:** General characteristics of the population

Variable	Categories	Frequency	Percentage
Educational status	Primary	5	4.7
	Secondary	23	21.3
	University	19	17.6
	Higher	61	56.5
Occupation	Work	61	56.5
	Not work	47	43.5
Economic status	Low	5	4.6
	Medium	38	35.2
	High	65	60.2

As shown in table 1, the general characteristics of the study group, 56.5% of the participants study till university level and above, 56.5% are work, and 60.2% have high economic status.

**Table 2:** Health characteristics of the population

Variable	Categories	Frequency	Percentage
Pregnancy stage	Less than 3 months	3	2.8
	3 – 6 months	7	6.5
	More than 6 months	42	38.9
	Non pregnant	56	51.9
Nutritional challenges	Yes	66	61.1
	No	42	38.9
Type of disease	Anemia	1	0.9
	Chest infection	1	0.9
	Diabetes	11	9.3
	Goiter + Diabetes	1	0.9
	Goiter	1	0.9
	Hernia	1	0.9
	Hormonal problems	1	0.9
	Heartburn	5	4.6
	Heartburn + GIT*	1	0.9
	No disease	86	79.6
BMI	Underweight	1	0.9
	Normal	23	21.3
	Overweight	44	40.7
	Obese	40	37.1

\*Gastro-intestinal tract problem

As shown in table 2. The health characteristics of the study group to determine the physical condition, nutrition problem and the type of disease before pregnancy. 48.1% are pregnant, 61.% facing nutritional challenges on their previous pregnancy, 79% have no type of disease before pregnancy, 40.7% overweight.

**Table 3:** Intake of different food groups during pregnancy

Foods	Category	Frequency	Percentage
Meat	No intake	7	6.5
	Intake / day	65	60.2
	Intake / week	25	23.1
Milk	No intake	6	5.6
	Intake / day	78	72.2
	Intake / week	14	13.0
Fish	No intake	20	18.5
	Intake / day	21	19.4
	Intake / week	31	28.7
Chicken	No intake	9	8.3
	Intake / day	67	62.0
	Intake / week	20	18.5
Lentils	No intake	27	25.0
	Intake / day	21	19.4
	Intake / week	36	33.3
Chips	No intake	24	22.2
	Intake / day	34	31.5
	Intake / week	22	20.4
Cake/ chocolate	No intake	20	18.5
	Intake / day	45	41.7
	Intake / week	22	20.4
Green veg.s	No intake	6	5.6
	Intake / day	56	51.9
	Intake / week	32	29.6
Fruits	No intake	8	7.4
	Intake / day	54	50.0
	Intake / week	27	24.8
Juices	No intake	5	4.6
	Intake / day	64	59.3
	Intake / week	21	19.4

Table 3 shows the intake of different food group during pregnancy. The food which are taken by the pregnant women /day includes meat 60%, milk 78.0%, chicken 67%, chocolate 54%, green vegetable 51.9%, fruits 50.0% juiced 59.3%. These indicate there is no problem for the food intake of the study group.

**Table 4:** Mean age and BMI

BMI	Mean age ± SD	Number
Underweight	27.0 ± 0.00	1
Normal	34.17 ± 6.4	23
Overweight	35.2 ± 8.2	44
obese	38.7 ± 7.8	38
ANOVA F = 3.18 df 3, P = 0.027**		

As shown in Table No.4. The mean age ± SD and body mass index. There is significant relationship between mean age of study group and Body Mass Index (p-value 0.027). The overweight population is high 44% of the respondent

**Table 5:** Correlation of Nutritional challenges in pregnancy and Number of deliveries

Number of deliveries	Nutritional challenges		
	Present	Absent	Total
2	22	17	39
3	11	1	12
4	15	10	25
5	11	7	18
More	7	5	12
$\chi^2 = 5.128$ ; P = 0.274 (NS)			

As shown Table No.5 The correlation of nutritional challenges in pregnancy and number of deliveries. There is significant relationship between nutritional challenges in pregnancy and number of deliveries (p-value 0.0274). The respondent facing nutrition challenges according to the number of deliveries

**Table 6:** Correlation of Nutritional challenges in pregnancy and working status

Nutritional challenges	Occupation		
	Work	Not work	Total
Present	39	27	66
Absent	20	20	40
Total	59	47	106
Mc Nemar test - P = 0.0382**			

As shown Table No.6 the correlation of nutritional challenges in pregnancy and working status. 66% of the respondent facing nutrition challenges according to their occupation. There is significant relation between nutrition challenges and work status (p-value 0.038).

#### 4.2 Discussion

General characteristics of the population, shows high economic status and overweight. There is significant relationship between mean age of study group and Body Mass Index (p-value 0.027).

Women with an unhealthy weight in a first pregnancy could be at greater risk for complications in their next pregnancy -- even if they're at a good weight, a new study finds. While moms who weigh too much or too little might have uncomplicated pregnancies and deliver healthy babies the first time around, our research shows they are still at increased risk of adverse outcomes during their second pregnancies. That risk may not go away even if they are at a normal weight when they get pregnant again," study senior author Jen Jen Chang, associate professor of epidemiology at Saint Louis University, said in a university news release.

Health characteristics of the population represents the absent of any type of disease before pregnancy. The nutrition challenges facing pregnant women include:- Anemia, chest infection, diabetes, heartburn, goiter and problems in gastrointestinal tract.

There is significant relationship between nutritional challenges in pregnancy and number of deliveries (p-value 0.0274). There is significant relation between nutrition challenges and work status (p-value 0.038).

#### 5. Conclusion

This study concluded that there are nutritional challenges facing women during their next pregnancies. A healthy weight is the best way to ensure a healthy pregnancy.

#### 6. Recommendation

Health education programs should be conducted at community level at Hail/KSA to highlight the risk factors of nutritional challenges on next pregnancy.

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