

A Study on Assessment of Health, Cognitive Behavior and Nutritional Status of Pregnant Women

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Abstract: The objective of the present study is to evaluate the Nutritional status and cognitive behavior, mental disorders of the pregnant women. For the purpose of study 40 pregnant women were selected. The age between 22-36 Years and the samples were collected from Govt. General hospital, Guntur District, Andhra Pradesh, India. Hemoglobin levels collected by Shahlis hemometer. Hemoglobin levels of pregnant women were below the standards. Nutrient intakes were collected by using 24 hrs recall method. The present study reveals that there were lower consumption in several macro and micro nutrients intake compared to Recommended Dietary Allowances (RDA) of India, which may be reflected on their nutritional status. Cognitive behavior and Psychological aspects of the pregnant women, not only those aspects but also it reflects on their health conditions.

Keywords: pregnant women, cognitive behavior, mental disorders, Health and Nutritional status.

1. Introduction

Pregnancy is the period of dynamic change for a mother requiring a lot of care. During this period the fetus is nourished directly by the mother through placenta. Since the baby totally relies upon its mother for nourishment, the pregnant woman is to be provided with an adequate and well-balanced diet (Mudambi,1992). A woman's normal nutritional requirement increases during pregnancy in order to meet the needs of the growing fetus and of maternal tissues associated with pregnancy. Proper dietary balance is necessary to ensure sufficient energy intake for adequate growth of fetus without drawing on mother's own tissues to maintain her pregnancy (Mridula *et al.*, 2003).

According to WHO, in developing countries, the prevalence of anemia among pregnant women is 56% (WHO, 1992). The prevalence of anemia in India is 60 -70% (Park, 2005). In India, anemia is the 2nd most common cause of maternal deaths accounting for 19% of total maternal deaths (Govt. of India, 2002).

Possible effects of maternal psychological distress during pregnant cyrange along a continuum from the immediate and disastrous (e.g., miscarriage) to the more subtle and long term (e.g., developmental disorders). Most existing research has focused on the effects of maternal distress on pregnancy itself. For example, there are numerous comprehensive reviews of research indicating that women who express greater distress during pregnancy give birth somewhat earlier to somewhat lighter babies than do women who are less distressed. The focus of this report is on the potential for maternal stress to generate more far-reaching effects on behavioral and cognitive development in childhood. Changes in brain structure and function of prenatally stressed animals have also been documented (Welberg & Seckl,2001). Yet not all documented effects of prenatal stress are negative mild stress has been observed to benefit, not damage, later learning in rats (Fujioka *et al.*, 2001).

2. Materials and Methods

The study was carried out among pregnant women, sampling method was adopted for surveying the sample and 40 pregnant women were selected. The age between 22-36 Years and the list of pregnant women was collected from Govt. General Hospital, Guntur District, Andhra Pradesh, India. An interview schedule was used for collection of Health and psychological information. Fewer Psychological factors and cognitive behavior observed. Twenty-four hours recall method of diet survey was applied for the collection of dietary information. The intake of nutrients by the respondents was calculated by using Nutritive Value of Indian Foods (Gopalan, 1991). Recommended dietary allowances suggested by the ICMR for pregnant women were utilized to assess the nutritional status.

Data Collection: Diet survey was carried out by weighing method (Rao *et al.*,1986).Quantitative dietary assessment was done through actual weighing of raw food item. The average dietary intake of food per item was calculated and was compared with the RDA (Recommended Dietary Allowances) of India using the values as per 'Nutritive Value of Indian Food' (Gopalan *et al.*, 2006).

Biochemical Analysis

Blood Hb levels were estimated using Shahlis hemoglobin as it was convenient to take the blood samples and percentage of Hb levels were compared with WHO standards (WHO, 1982).

3. Results and Discussion

Table 1: Health Complications of pregnant women (N= 40)

Health Complications	No of respondents	No of Non-respondents
Nausea	21(52.5)	19(47.5)
Headache	16(40.0)	24(60.0)
Fatigue	38(95.0)	12(30.0)
Constipation	29(72.5)	11(27.5)
Frequent illness (Cold, Cough and Fever)	27(67.5)	13(32.5)

Table 1 shows health complications of pregnant women, these symptoms were common among pregnant women Nausea, Headache, Fatigue, Constipation, Frequent illness (Cold, Cough and Fever) etc. Majority of the respondents were suffering from health problems like 52.5 per cent were had nausea, 40.0 per cent were had Headache, 95.5 per cent were having the problem of Fatigue (easily tiredness) and 67.5 per cent were suffering from Cold, Cough and Fever. Biological explanations of pregnancy vomiting have stimulated medical interventions like dietary changes, antiemetics, vitaminB6, etc. (Rayburn and Hoffman, 1986). The association of anticholinergic and antihistamine medication with vitamin B6 reduces the number of days with nausea, as well as nausea severity (Wheatley,1977). while vitamin B6 alone seems to have better results among patients with severe nausea than among patients with mild to moderate nausea (Sahakian *et al.*, 1991). Benton claimed that people suffering from micronutrient deficiencies often display this through psychological channels such as mood (2008a).

Table 2: Cognitive and psychological behavior of pregnant women (N=40)

Cognitive and Psychological aspects	No of respondents N=40 %	No of Non-respondents
Mood changes	25(62.5)	15(37.5)
Memory loss	16(40.0)	24(60.0)
social stimulation	21(52.5)	19(47.5)
Food aversions or cravings	19(47.5)	21(52.5)
Irritability	27(67.5)	13(32.5)
Apathy	22(55.0)	18(45.0)

Table 2 shows Cognitive and psychological behavior of pregnant women, Psychological changes are common among pregnant women due to hormonal changes and nutritional deficiencies during pregnancy such as Mood changes, Memory loss, social stimulation, Food aversions or cravings, Irritability and apathy etc. Majority of the respondents (62.5%) had Mood changes, 40.0 per cent were in Memory loss. Memory loss in the sense having the habit of forgetting and other behaviors social stimulation, irritability, apathy and Food aversions or cravings are commonly observed among pregnant women. The present study shows the behavior problems among pregnant women. Nutrient deficiencies also plays an important role and the present study in accordance with the studies. The thiamine deficiency disease known as Beri beri has long been associated with memory loss. This has led experts to the conclusion that long-term thiamine deficiency can cause a disruption in cognitive function and memory retention (Benton, 2008). If a lack of thiamine can cause memory loss, it may be possible that taking a thiamine supplement can help to prevent the conditions which lead to memory loss.

One area of development in which nutrition plays a very important part is the development of the mind. There are many diverse areas relating to cognitive development which are influenced by nutrition. According to Bonnie Kaplan nutritional status affects factors such as social stimulation, mood, behavior, and physical development of the brain (1988). The area in which nutrition has the greatest effect is the physical development of the brain and body, which relate to numerous other factors that affect cognitive development.

Another mineral that is essential, yet has only a small time in which to make a difference is choline. Choline is necessary during the stage in which the fetus' mind is being formed (Rosales *et al.*, 2009). Infants who were studied by Lozoff *et al* in Costa Rica were followed up at the age of 5 years. Children who had been anaemic in infancy (haemoglobin <10 g/100 ml) had lower developmental scores at age 5 than those who had not been anaemic, regardless of treatment group and despite similar mean current haemoglobin values in the two groups.

Oxidative processes have been suggested to contribute to the development of AD. Therefore, antioxidants that counteract the detrimental effects of oxidative stress may reduce the risk. It is unknown whether dietary intake of vitamin E and other antioxidant nutrients prevents the development of AD. Prospective and longitudinal studies show different results. The strongest evidence for an association with cognition has been reported for vitamins C and E. In June 2002 Engelhart *et al.* (2002) presented new results from the Rotterdam study (see above), in which high intakes of vitamins C and E were associated with a lower risk of AD. The number of studies that argue for a protective effect of antioxidants on cognitive performance is increasing, but more prospective studies are needed.

While most micronutrient deficiencies are likely to be resolved with improvements in economic outcomes by way of rising caloric intake, deficiency in utero for four nutrients in particular (B6, B9, B12, and iodine) has been biologically linked to irreversible and continuous damage to cognitive development throughout an individual's lifetime (Bottiglieri *et al.*, 1995; Guilarte 1993; Fioravanti *et al.*, 1997; Hankey 1999; Alpert and Fava, 1997; Schneede 1994; Cao *et al.*, 1994; Hetzel and Mano, 1989; Pharoah and Connolly, 1987). Because of these persistent changes on learning over the lifespan, the proposed research project will examine these nutrients, B6, B9 and B12, on subsequent cognitive development.

Table 3: Mean hemoglobin levels of pregnant women

S. No	Heamoglobin levels	No of respondents
1.	Hb < 10 mg/dl	22 (55.0)
2.	Hb >10 mg/dl	18 (45.0)
	Total	40 (100.0)

Table3: Shows the Hemoglobin levels of pregnant women. Most of the pregnant women are anemic and their hemoglobin levels are < 10 mg/dl. The present study intends that 55.0 per cent of pregnant women hemoglobin levels were considered < 10 mg/dl and 45.0 per cent of pregnant women hemoglobin levels were considered as >10 mg/dl.

There is increasing evidence that low iron status adversely influences physiological functions not only due to reduced hemoglobin synthesis but also because of decreased activity of iron containing enzymes in the brain (Benton, 2008).

Table 4: Average nutrient intakes of pregnant women

S. No	Nutrients	Mean \pm SD	RDA
1.	Energy (kcal)	2132.7 \pm 214.1	2525
2.	Protein (g)	56.4 \pm 10.2	65
3.	Calcium (mg)	598.3 \pm 76.5	1000
4.	Iron (mg)	23.2 \pm 14.7	38
5.	VitaminA (mg)	1247.5 \pm 117.5	2400
6.	Thiamin (mg)	0.93 \pm 2.8	1.3
7.	Riboflavin (mg)	0.67 \pm 4.7	1.5
8.	Niacin (mg)	11.9 \pm 6.3	16
6.	Vitamin C (mg)	34.1 \pm 7.7	40
8.	Folic acid (μ g)	152.6 \pm 8.9	400
9.	Vitamin B ₁₂ (μ g)	0.52 \pm 2.1	1.0

Table 4: shows the mean nutrient (macro and micro) intake per consumption unit per day among pregnant women. The mean calories consumption among pregnant women was 2132.7 \pm 214 k.cal. The mean protein consumption among pregnant women was 56.4 \pm 10.2 g. The mean intake of calories and protein were lower when compared to Recommended Dietary Allowances (RDA). Calcium, iron, Vitamin A, vitamin C and folic acid were also lower than the standards. A dietary approach made from a food survey presented foods commonly consumed by population recruited indicated very monotonous eating habit combined with imbalanced diets. B-complex vitamins such as Thiamine, Riboflavin Niacin and Vitamin B₁₂ were also lower than the standards. Pregnancy is normal physiological phase where rapid growth takes place in the mother's body. Before pregnancy a women needs nutrients for growth maintenance of her body. Good nutrition keeps her healthy. During pregnancy additional requirement for all nutrients occurs to enable the foetus to grow normally in the uterus.

The effects of some diseases can be reduced by consuming nutrient dense foods, such as meat. Meat is an important part of most healthy diets because it contains many essential amino acids and vitamins (Tapsell, 2007). These nutrients are essential to the function of the body and the immune system. Carotenoids are small nutrients which can convert to vitamin A under the proper circumstances. However, on their own they serve as a powerful antioxidant and boost the immune system (Carpenter & Finley, 2005).

Micronutrients such as iron are not the only nutritional components which have an effect on the mood and behavior of children. Researchers Liu and Raine concluded that both micronutrients and macronutrients have a noticeable effect on childhood behavior (Benton, 2008b).

Vitamin A is essential in cell differentiation (Thompson & Manore, 2006). Differentiation is the process through which cells split and begin to perform different functions. Without the proper amount of vitamin A cells could not possibly perform their tasks properly. The B vitamins, such as B12 and B6, are very important vitamins because they help keep the digestive system working properly. These nutrients are key components of the metabolic processes (Blake, 2008).

A deficiency of folate during the stages of early pregnancy can be linked to the increased risk of giving birth to a child with physical defects (Carpenter & Finley, 2005). Before a child is born the nutrients which it receives come through its mother, and the window of opportunity for nutritional

impact may be small. Folic acid is only exceedingly important until the spinal cord closes. The fetus needs this nutrient in order to properly develop its spinal cord. A lack of proper nutrition for the expectant mother can have devastating, lifelong consequences for her unborn child.

IPF is also affected by the intake of green and yellow vegetables. A study of eating habits for those with IPF showed a marked improvement in those who had a high intake of green and yellow vegetables (Miyake *et al.*, 2004). These vegetables are rich in nutrients such as iron that the body needs to fight off diseases. A diet which includes these foods will have a marked effect on diseases that build on lack of nutrition. It has been found that eating vegetables and other plant foods can have a significant effect on disease prevention because of the fiber and other nutrients which they contain (Lea *et al.*, 2006). The present study results showed that the nutrient intakes of pregnant women were lower than the standards and other complications such as health, cognitive behavior and mental disorders were commonly observed among pregnant women and hemoglobin levels were also lower than the standards.

4. Conclusion

Nutritional problems have serious public health significance impacting psychological, physical, Cognitive behavior and psychological disorders of pregnant women. Iron deficiency is by far the commonest nutritional cause of anemia. It may be associated with folate deficiency, especially during pregnancy. Pregnant women form a large high-risk group requiring special care should be taken. For supplementary nutrition, iron and folic acid tablets should be supplied to the pregnant women. For the maintenance of healthy and active life, access to safe and nutritious food is essential. Importance and special care should be given. Because nutrition is very important during pregnancy in order to maintain health, cognitive and psychological behavior of pregnant women. Adequate nutrition among pregnant women helps to give birth to healthy baby.

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