



Assessment of Nutrition Profile of Pregnant Women in Rural Area (Mymensingh District) of Bangladesh

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Abstract: Malnutrition is the most common nutritional disorders in the developing countries like Bangladesh. The most vulnerable groups of population to malnutrition are under-5 children, pregnant women and lactating mother. This study makes an attempt to investigate the nutritional status of pregnant women and to correlate different factors with pregnancy. The cross-sectional study was followed to determine nutritional status by anthropometric and biochemical assessment as well as clinical appearance. The obtaining result of all assessments was compared with standard data (NCHS & UNHCR/WFP). A total of 380 pregnant women were randomly selected from health care centers (governments and non-governments) in the Mymensingh district of Bangladesh from early June 2007 to January 2008. The result of research showed that 30.52% severely malnourished, 36.57% moderately malnourished, and 23.15% well nourished and 9.73% were overnourished by calculating weight gain during different stages of pregnancy. By using Mid-Upper Arm Circumference (MUAC) 28.94%, 35%, 25.26% and 10.78% of pregnant women were found severely malnourished, moderately malnourished, well nourished and overnourished respectively. It observed that the prevalence of nutritional status to pregnant women were found 29.69% severely malnourished, 34.39% moderately malnourished, 26.36% well nourished and 9.56% over nourished by observing the clinical appearance. In average it showed that 29.71% were severely malnourished, 35.32% were moderately malnourished, 24.92% were well nourished and 10.02% were overnourished. By estimating hemoglobin (Hb) level during pregnancy it obtained that 5.52% severely anemic, 61.84% moderately anemic, 18.15% mildly anemic and 14.47% of pregnant women were nonanemic. In my study, 12.63% of pregnant women were under 18 years old while 50% were severely malnourished and 30.4% were malnourished. It found that the primary education levels were 16.57% and total monthly family incomes of 16.57% of pregnant women were below Tk. 5000. Most of them (73.66%) were malnourished because of those stated reasons. In Mymensingh district, the major responsible factors were younger marriage, frequent birth, illiteracy, poverty, misconceptions, food taboos, lack of nutritional knowledge, geographical location (hill tract region) etc. The data obtained from my study is very much alarming and need to address by governments and nongovernmental organization.

Keywords: Nutrition, Profile, Malnutrition, Pregnant women, Mymensingh.

1. Introduction

Pregnancy is a normal physiological phase where rapid growth takes place in the mother's body. The fetus in the mother's uterus grows more rapidly than after birth. The zygote develops into a seven-pound baby within 9 months. At the time of birth, the infant was 9 months old. Optimum development of the infant is necessarily a function of parental diet. Inadequate maternal nutrition results in low birth weight of the

infant and high depletion of mother's body reserves of nutrients. Premature death, maternal death and low vitality of the infants are due to the poor nutritional status of pregnant mothers. Before pregnancy, a woman needs nutrients for growth and maintenance of her body. Good nutrition keeps her healthy. During pregnancy additional requirement for all nutrients occurs to enable the fetus to grow normally in the uterus [1]. Good nutrition and a healthy lifestyle are central to the Clinic's overall approach to all aspects of

reproductive planning. Research shows how critical a good diet full of the right nutrients can be, not only to your fertility but also to your health and wellness during pregnancy and to the all round prospects for your baby. There is a strong correlation between a mother's diet during pregnancy and a baby's birth weight and future health. Babies born with a low birth weight are at greater risk of ill-health and disease, whereas those with a good weight are likely to have a higher IQ and a better start in life. Recent research by Professor David Barker from the Medical Research Council suggests that a mother's prenatal nutrition can even influence a child's long-term health. Good nutritional planning can reduce the likelihood of complications arising for mothers-to-be too, such as hypertension or gestational diabetes. And it can help to reduce common problems like pregnancy sickness, heartburn and constipation, as well as helping to improve your energy levels [2].

Malnutrition is not unknown matter at now in any of the worlds. It has created interest in nutrition from the last 50th decade ago at national and international level. In the world, 60% of total population and 70% of total children have affected malnutrition and among 50% of women suffer long-term energy deficiency, more than 70% of total pregnant women suffer anemia. In our country, the most vulnerable groups of population to malnutrition are children, pregnant women and lactating mother. It has been observed that during abortion 4.4 per 1000 of live births of mother are dead [3].

Half of the total female and children in Bangladesh are suffering from malnutrition. In slum area, 95% mothers suffer from malnutrition. 50% of newborn babies are born with Low Birth Weight (LBW) due to malnutrition of the mother. 70% female in Bangladesh is low weight for height. In our country during pregnancy 40% in anemia, 15% in infection, 13% in abortion 8% in complication, 12% suffer from high blood pressure and 25% suffer bleeding after abortion [4].

2. Methodology

Methods and materials are necessary for assessment, analysis, and surveillance of nutrition. Nutritional problems are complex in their etiology and their many different nutritional deficiency diseases. Knowing how they occur is one vital part of solving and better still, preventing nutritional problems. For determination nutritional status and analysis nutritional survey is conducted for collection of a broad range of dietary, clinical, biochemical, anthropometric and socioeconomic data. It is usually included the regular and timely collection Data, analysis and reporting of nutrition-relevant data.

For determination of nutritional status of pregnant women in the Mymensingh district, among several

types of study design, a cross-sectional study was conducted. It includes their economic and socio-demographic data, cultural practice, food habits, food beliefs and food prices.

A cross-sectional study or a prevalence study measures the prevalence of symptomatic, determinant of the symptom, or both, in a population at one point in time or over a short period of time. It provides a snapshot of the health experience of a population at a given time. This information is very useful in assessing the health status and needs of the population. The prevalence of a problem, rather than the incidence, is recorded in a cross-sectional survey.

2.1 Study Design

2.1.1 Sampling Frame

Survey on nutritional status of pregnant women in Mymensingh district of Bangladesh. A total of 380 pregnant women were randomly selected from health care centers (governments and non-governments) in the Mymensingh district of Bangladesh from early June 2007 to January 2008.

2.2 Sampling Procedure

2.2.1 Selecting of Sampling Units

Mymensingh medical college hospital, Surjer Hashi Chinito Shastho Clinic, Jamtolamor, Patgutham Mor, Maa o Shishu Poribar Kollan Kendra Kalibari, The Sun Pathology Center, Char Para Mor, Sadar-Mymensingh, Sasto o Poribar Kollan Kendra, Fulbaria-Mymensingh, Upazila Shastho Complex, Haluaghat, Muktagacha, Trishal, Bhaluka, Gafargaon, Nandail, Gouripur-Mymensingh.

2.2.2 Study Population

The study population consists of pregnant women of various areas in the Mymensingh district of Bangladesh. A total of 380 pregnant women were examined and with interviews from various area of the Mymensingh district.

2.2.3 Study Instruments

The questionnaire and some standard technique of anthropometric and biochemical measurements.

Questionnaire: A pregnant women were interviewed directly for information like age, family member, child of respondent, educational qualification of pregnant women & their husband, family income, work status, family status & living status of pregnant women, daily requirements of nutrients, vaccination during pregnancy, awareness about common disorder during pregnancy, proficiency any food taboos etc. Appropriate question were prepared to ask the mothers to drive information on the subject from which were to be obtained by questioning. The question was first prepared in Bengali and then finalized in English. The questionnaire is described in the appendix.

Table 1. Level of Nutritional Status based on Mid-Upper Arm Circumference (MUAC).^[5]

Mid-Upper Arm Circumference (cm)	Category (Nutritional Status)
< 22	Severe Malnourished
22-24	Malnourished
24-26	Normal
≥ 27	Over Nourished

The UNHCR/WFP Guidelines for Selective Feeding Programs in emergencies, 1999 mentioned MUAC < 22 is severely malnourished and that pregnant woman is selected for selective feeding program for minimizing malnutrition. On the basis of this value (< 22), it can be considered above category.

2.2.4 Weight Gain during Pregnancy^[6]

The optimal weight gain for pregnant women during pregnancy is about 1.5 Kg in the first three months. In each subsequent month, the average gain should be 1.5 kg, being a little more in the last two or three month. At full term, the total gain is about 10 kg. Fat deposition and placental growth proceed rapidly in the first half of pregnancy and fetal growth in the

second half. With excessive vomiting in early pregnancy, a slight loss of weight may occur. Sudden changes in weight, either gain or loss may be harmful. On the basis of this weight gain, it can be categorized in the following Table 2.

Table 2. Level of weight gain and category of pregnant women.

Level of Weight Gain	Trimester & amount of weight gain (kg)			Category
	1 st	2 nd	3 rd	
No/ Little	< 0.5	< 1.5	< 1.5	Severe Malnourished
Moderate	0.5-1	2-4	2-4	Malnourished
Ideal	1-2	4-5	4-5	Well Nourished
Heavy	> 2	> 5	> 5	Over Nourished

2.2.5 Physical Examination/ Clinical Assessment

The physical examination defined by Jelliffe (1966), examines those changes, believed to be related to inadequate nutrition, that can be seen or felt in the superficial epithelial tissue, especially the skin, eyes, hair, and buccal mucosa, or in organs near the surface of the body (e.g. Parotid and thyroid glands). An example of the physical assessment form used in the Nutrition Canada National Survey is given in Table 3.

Table 3. Normal appearance and associated sign of malnutrition of various organs of the body of pregnant women.^[7]

Normal Appearance	Signs Associated With Malnutrition
Hair: shiny; firm; not easily plucked	Lack of natural shine; hair dull and dry; thin and sparse; hair fine, silky, and straight; color changes (flag sign); can be easily plucked
Face: Skin color uniform with a smooth, pink, healthy appearance; not swollen	Skin color loss (depigmentation); skin dark over cheeks and under eyes (malar and supraorbital pigmentation); lumpiness or flakiness of skin of nose and mouth; swollen face; enlarged parotid gland; scaling of skin around nostrils (nasolabial seborrhea)
Eyes: Bright, clear, shiny; no sores at corners of eyelids; membranes are a healthy pink & are moist. No prominent blood vessels or mound of tissue or sclera.	Eye membranes are pale (pale conjunctivae); redness of membranes (conjunctival injection); bitots spots; redness and fissuring of eyelid corners (angular palpebritis); dryness of eye membranes (conjunctival xerosis); cornea has dull appearance (corneal xerosis); cornea is soft (keratomalacia); scar on cornea; ring of fine blood vessels around cornea (circumcorneal injection).
Lips: smooth, not chapped or swollen	Redness and swelling of mouth or lips (cheilosis); especially at corners of mouth (angular fissures and scars).
Tongue: Deep red in appearance; not swollen or swollen	Swelling: scarlet & raw tongue; magenta (purplish) color of tongue; swollen sores; hyperemic & hypertrophic papillae.
Teeth: no cavities; no pain; bright	Maybe missing or erupting abnormally; grey or black spots (fluorosis); cavities (caries).
Gums: Healthy; red; do not bleed; not swollen	Spongy & bleed easily.
Face: face not swollen	Thyroid enlargement (front of the neck); parotid enlargement (cheeks become swollen).

Table 4. Hemoglobin levels in anemia (from ACC/SCN, 1991a).^[8]

Hemoglobin level (gm/100ml)	
Hemoglobin below these levels means anemia	
Children 6 months to 5 years	11
Children 6 years to 14 years	12
Men	13
Women (not Pregnant)	12
Women (Pregnant)	11
Mild, moderate and severe anemia	
Normal	> 11
Mild	10-11
Moderate	7-10
Severe	< 7

2.2.6 Biochemical Assessment

- a) **Hemoglobin:** Iron is an essential component of the hemoglobin, the oxygen-carrying pigment of the red blood cells. Each hemoglobin molecule is a conjugate of a protein (globin) and four molecules of haeme.

3. Results

After surveying on 380 pregnant women in the region of the Mymensingh district of Bangladesh & comparing various data I found the following results.

Table 5. Distribution of nutritional status of pregnant women by clinical appearance.

Nutritional Status	No. of Pregnant Women	% of Pregnant Women
Severe Malnourished	113	29.69
Malnourished	131	34.39
Well Nourished	100	26.36
Over Nourished	36	9.47
Total	380	100

The Table shows the distribution of pregnant women according to their nutritional status during pregnancy by clinical appearance. In the Mymensingh district of Bangladesh 29.69% of pregnant women were severely malnourished, 34.39% malnourished, 23.15% well nourished and the rest of 9.73% were overnourished. This data were obtained by observing the clinical appearance of pregnant women during pregnancy. The graphical representation is in the following.

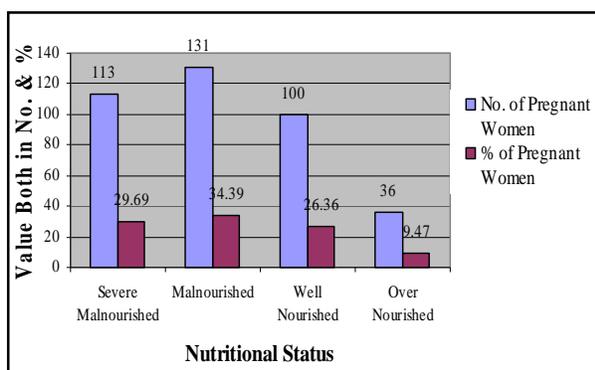


Fig. 1. Total percentage and number (n=380) of nutritional status of pregnant women by clinical appearance.

Figure shows, the blue bars indicated total number and red bars indicated total percentage of pregnant women according to nutritional status by clinical appearance. The bars also show, in the region of the Mymensingh malnourished pregnant women is more than well nourished.

Table 6. Distribution of nutritional status of pregnant women by their level of weight gain.

Nutritional Status	No. of Pregnant Women	% of Pregnant Women
Severe Malnourished	116	30.52
Malnourished	139	36.57
Well Nourished	88	23.15
Over Nourished	37	9.73
Total	380	100

The table shows the distribution of pregnant women according to their nutritional status during pregnancy. In the Mymensingh district of Bangladesh 30.52% of pregnant women were severely malnourished, 36.57% malnourished, 23.15% well nourished and the rest of 9.73% were overnourished. This data were obtained by calculating the weight gain during pregnancy and nutritional status is categorized by comparing the data with standard weight gain Table. The graphical representation is in the following.

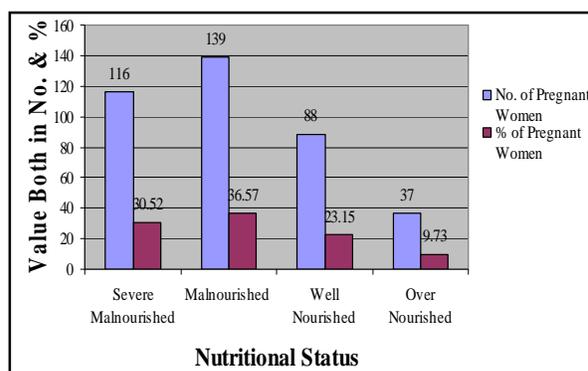


Fig. 2. Total number (n=380) and percentage of pregnant women by their nutritional status.

Figure shows, the blue bars indicated total number and red bars indicated total percentage of pregnant women according to their nutritional status. The bars also shows, in the region of the Mymensingh about 30.52% of pregnant women were severely malnourished, 36.57% malnourished, only 23.15% well nourished, and the rest of 9.73% were overnourished.

Table 7. Distribution of anemic condition of pregnant women by the level of hemoglobin status.

Anemic Condition	No. of Pregnant Women	% of Pregnant Women
Severe	21	5.52
Moderate	235	61.84
Mild	69	18.15
Nonanemic	55	14.47
Total	380	100

The table shows the distribution of pregnant women according to level of anemic condition. In the Mymensingh district of Bangladesh, about 5.52% pregnant women were severely anemic, 61.84% moderate anemic, 18.15% mildly anemic and only

14.47% of pregnant women were nonanemic. The graphical representation is in the following.

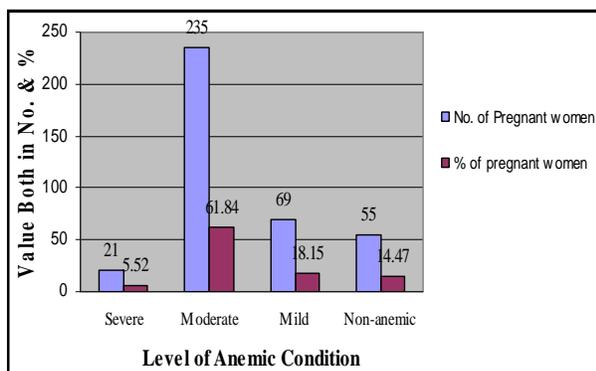


Fig. 3. Total number (n=380) & percentage of pregnant women according to level of anemic condition.

Figure shows, the blue bars indicated total number and red bars indicated total percentage of pregnant women according to their anemic condition. The bars also shows, in the region of the Mymensingh majority of pregnant women (61.84%) were moderately anemic and only 14.47% were nonanemic.

Table 8. Distribution of nutritional status of pregnant women by Mid-Upper Arm Circumference (MUAC).

Nutritional Status	No. of Pregnant Women	% of Pregnant Women
Severe Malnourished	110	28.94
Malnourished	133	35
Well Nourished	96	25.26
Over Nourished	41	10.78
Total	380	100

The Table shows the distribution nutritional status of pregnant women by using MUAC level. In the Mymensingh region of Bangladesh about 28.94% of pregnant women were severely malnourished, 35% malnourished, 25.26% well nourished and only 10.78% of pregnant women were overnourished. This result obtained by comparing the MUAC level with the recommended table in methods & materials chapter.

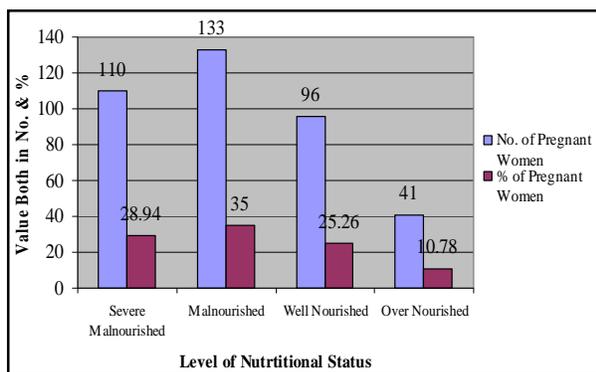


Fig. 4. Total number (n=380) & percentage of pregnant women distribution by MAUC.

Figure shows, the blue bars indicated total number and red bars indicated total percentage of pregnant women according to their nutritional status by using MUAC level. The bars also shows, in the region of the Mymensingh majority of pregnant women (35%) were malnourished and only 10.78% were overnourished.

4. Discussion

Pregnancy is the carrying of one or more offspring, known as a fetus or embryo, inside the uterus of a female human. In a pregnancy, there can be multiple gestations, as in the case of twins or triplets. Human pregnancy is the most studied of all mammalian pregnancies. Obstetrics is the medical field that studies and treats pregnant patients. Childbirth usually occurs about 38 weeks from fertilization, i.e., approximately 40 weeks from the start of the last menstruation. Thus, pregnancy lasts about nine months, although the exact definition of the English word “pregnancy” is a subject of controversy.

Mymensingh is the poorest district of Bangladesh. Malnutrition is the nutritional disorder caused by insufficient, unbalanced or excessive diet or by impaired absorption or assimilation of nutrients by the body. Especially it is a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients. Malnutrition is one of the major causes of morbidity and mortality in Bangladesh. Malnutrition has severe consequences on pregnancy-related complications, premature birth, intrauterine growth retardation, LBW and aggravates the risk of perinatal and neonatal deaths. Addressing the synergic effect of malnutrition the NNP undertakes nutritional interventions for mothers, children, and adolescent girls in 105 upazilas of Bangladesh. One of the important aims of the program is to intervene in inter-generational effects of malnutrition through improving the nutritional status of pregnant and lactating women for reducing the incidence of LBW and getting better health of children.

5. Conclusion

Bangladesh is densely populated and poorest country in the world with a low per capita income. About 47% of their population lives below the poverty level. Although, it is mainly an agricultural country per capita availability of land is only 0.38 acres and per capita, food income is only 13 ounces per day. Because of the scarcity of food more than half of the population suffers from malnutrition and the majority of there are women and children. The nutrition situation of the Mymensingh region of Bangladesh has not improved satisfactorily as an educational environment & need more attention. Malnutrition, under-weight is more common nutritional problems in Bangladesh. This condition may arise different types of complications

that are life threatening for pregnant women. There is no magic pill that can reduce or increase the nutritional status of the pregnant women. But yet people spend a lot of money for pregnant women to buy different types of tonics and drugs for maintaining standard weight, height for their age and sex. If the individuals are conscious of nutritional knowledge, nutritional value of food and dietary habits, they can easily overcome those problems and can make sound health and body without excess money wasting.

It is hoped that the study would be useful in understanding the severity of the nutritional status of pregnant women and increases the awareness of the need of pregnant women for accomplishing their physical, mental, and academic achievements. A different approach may be developed to offer rural and poor urban women the opportunity to feed themselves properly, perhaps through appropriate household or village-scale technology. The governments of Bangladesh need to address these problems seriously.

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