Original Research Article

Role of Health and Nutritional Care on Outcome of Pregnant Women in Birdem Hospital, Bangladesh

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A B S T R A C T

K e y w o r d s	A cross sectional study was conducted among the randomly selected 250 pregnant mother who delivered a baby in BIRDEM hospital and the major aim was to measure the pregnancy outcome and the role of nutrition of it. The observing pregnant mother's average age was 28.9 ± 4.9 years and majorities of them were housewives (79%). The mean household income was Tk. $42,034.40 \pm 8,903.86$ only, which may possible to standard living cost. However, it was a threaten that more than one third (34.0%) of the mother deliver low birth weight baby. Immediately after birth, the nurse or doctor measure the Apgar score and it was observed that only 40.8% babies Apgar score was good as the score 8 to 10 is denoted better health condition. About one third (27.6%) of the pregnant women
Low Birth Weight,; Apgar Score; BMI; Pregnancy Complications.	complain than their had been occurred some pregnancy related complications such as pre-eclampsia/eclampia/ toxemia (25.4%), gestational diabetes mellitus (18.9%), premature delivery (12.7%) and obstructed delivery (11.3%) etc. The relation between monthly income and nutritional status of the mother immediately after delivery by cross tabulation was very poor (r=0.109). More normal BMI levels were observed in medium monthly income compare to higher income. Housewives were more low birth weight baby deliver compare to NGO services holders. A non linear regression between birth weight and nutritional status were observed. It was surprisingly noted that there was negative correlation (r = -0.158) found between monthly income and knowledge about food and nutrient and significant (p<0.05) at two-tailed partial correlation test. Food consumption pattern indicated that as income rises the consumption of roti/ chapatti/ bread consumption were decreases at the breakfast whereas meat, fish, egg or vegetables consumption were the same as the income rises. During lunch and dinner food item choices does not depends on their monthly income. In case of meat, fish and egg consumption, there was very similar trend observed in both lunch and dinner.

Introduction

Nutritional status during pregnancy is extremely important. Not only does dietary intake influence pregnancy outcome for both mother and child, but it also has a direct impact on future lactation performance. During pregnancy, a number

of metabolic and functional adaptations occur, particularly in mechanisms for energy utilization. There are many causes of early pregnancy loss, spontaneous abortion and intrauterine growth retardation. Although some of these losses are caused by an abnormal chromosome (genetic), others cannot be explained (idiopathic) (Hobbins *et al.,* 1990). Social discrimination favoring male more than female, physical and mental stress, interfamily food distribution favoring the male adult and the male child, food taboos, inadequate intake of nutrients and micronutrients during pregnancy is the main causes of the problem (Jordan *et al.,* 1989). Pregnancy is an important time in a women's life. It is the time when a baby grows inside her body. To grow properly this unborn child needs a healthy and well-nourished mother. A woman who is pregnant needs more food than at other times because she needs extra energy for the baby growing inside her. At this time a pregnant women needs more food than other adult's do (WHO. 1997). As the woman nourishes herself she also nourishes the growing fetus as well as the placenta to which the fetus in her uterus is attached by its umbilical cord. At the same time her breast tissue prepares for lactation. Proper care during pregnancy and childbirth are important to the health of both a mother and her baby (BDHS2000). In some cultures there is a fear that extra food given during pregnancy will make the baby too large and thus cause a more difficult or complicated delivery. This is not true for healthy women of normal size. Women of short stature or with a contracted pelvis may have difficulty in delivering babies and may require special care before and during delivery (WHO. 1997). A pregnant woman needs the best foods available to the family: milk, fruit, vegetables, meat,

fish, eggs, grains, peas and beans. All these foods are safe to eat during pregnancy (ICDDRB. 1999). A pregnant woman's energy intake should be adjusted to take into account her nutritional status and level of physical activity. Women, who are required to maintain high rates of activity, particularly if they are undernourished, should be encouraged to increase their energy intake. Ideally, they should be provided with dietary supplements. Well-nourished women, on the other hand, should be advised not to increase their normal energy intake to avoid gaining too much weight. The amount and rate of weight increase during pregnancy is generally a good guide for making individual recommendations on energy intake.

In well-nourished populations in developed countries, the weight gain during pregnancy is about 12.5 kg. Women of small stature tend to have smaller babies and would logically fall in the lower range of normal weight gains and hence need less additional energy than the average. Obese women need to gain less fat than slimmer women, and women who are underweight for their height need to gain more than the average (Royston. 1982). The use of alcohol, tobacco, excessive amounts of caffeine, and other drugs may be particularly harmful during pregnancy because of their effect on the fetus. Smoking, for example, is associated with low birth weight, while the use of alcohol and other "recreational" drugs has been linked to dysfunction of the nervous system and other congenital defects. Mothers-to-be should be made aware of these problems and encouraged to avoid using such drugs during pregnancy (Harrison.1985). Special attention should be given to the overall composition of a pregnant woman's diet, which should be

mixed and varied to ensure an adequate intake of protein, vitamins and other essential nutrients. Cultural taboos notwithstanding, there is generally no need to avoid any specific foods during pregnancy (Shams. 1997).

Materials and Methods

Study Design

A prospective cross sectional studies was carried out among the 250 pregnant mother whom delivery occurred in hospital and the sample selection were randomly selected from the BIRDEM Hospital during October'2008 to December'2008. Anthropometric, socio-economic and dietary intakes of 24-hours were collected.

Sample Size

A statistical method will be applied to determine the sample size by the following formula:

Sample size n = z^2pq/d^2 = 384	Here,
= $(1.96)^2$ X0.5 X 0.5 / $(0.05)^2$	n = Sample size
	P = Prevalence rate = 0.5 [6]
= 3.8416 X 0.25 / 0.0025	Q = (1-P) = (1-0.5) = 0.5
	d = 5% level of confidence interval = 0.05
= 384.6	Z = 1.96; Value of the
≈384	normal variable which is equal to 1.96 at 5% level of significance

Development of Questionnaire

A questionnaire was developed containing both closed & open ended questions to obtain relevant information on anthropometric, socioeconomic, dietary condition of the adolescent girls. All questions were designed, pretested, modified and resettled to obtain and record information easily. Any modification necessary were then made and a final recoded, pretested questionnaire was drawn up.

Anthropometric Assessment

The anthropometric data were collected based on standard methods. Age of the subjects under study was determined by interrogation and confirmed through probing if the birth certificate or the health card were unavailable. Measurements of weight and height were obtained from all subjects. The subjects were weighed wearing minimal cloths and bare footed. Three weight measurements were obtained using a bathroom weighing scale and the average was calculated and recorded to the nearest 0.1 kg. The height was measured with a wooden measuring board without shoes and the average was calculated and recorded to the nearest 0.1 cm. Body Mass Index (BMI) is the best method of measuring the nutritional status of the respondent.

$$BMI = \frac{Weight\ in\ kg}{Height\ in\ m^2}$$

Data Collection Procedure

Socio-demographic, anthropometrical information and clinical sign symptoms of malnutrition related individuals, different food insecurity factors such as agriculture production, post harvest losses, lack of employment opportunity women and child care was collected by the face to face interview schedule.

Data analysis

The data set were first checked, cleaned and entered into the computer from the numerical codes on the form. The data was edited if there is any discrepancy and then cleaned it. The frequency distributions of

the entire variables were checked by using SPSS 14.0 windows program. For tabular, charts and graphical representation Microsoft word and Microsoft excel were used.

Ethical consideration

Permission from BMRC and SUB was granted from the hospital authority.
Informed written consents from the eligible mothers were taken.
Privacy of the observation and results was taken Confidentiality.

Results and Discussion

A prospective cross sectional studies was carried out among the 250 pregnant mother whom delivery occurred in hospital and the sample selection were randomly selected from the BIRDEM Hospital during October'2008 to December'2008. Table-1 shows the Socio-demographic features of the respondent from BIRDEM Hospital. The table indicated that more than one third (36.8%) of them aged 26 to 30 years. However, a considerable number of respondents were aged more than thirty five percent. Among them a large part (79.2%) was housewives and the other respondents were Teacher-2.8%, NGO service holder- 3.2%, Doctor/Engineer-8.8% and Business 0.8% and were in other occupation-5.2%. Among the respondents one thirds (34.4%) were S.S.C passed, and 28.0% were H.S.C passed, whereas 16.4% were Graduate and above, and only 1.2% were illiterate. Table 1 gives a close look at the monthly household income of respondents and the table reflects that the household income level 5000-10000, 10001-20000, 21001-30000, 30001-40000, 40001-50000, 50001-60000 and more than 60000 comprises 3.2%, 15.6%, 18.4%, 16.4%, 16.4% 16.8% and 13.6% respectively.

Again, the mean household income was Tk. 42,034.40 ± 18,903.86 only. Table 2 implies the nutritional status of respondents according to BMI and it found that a larger part (40.8%) were overweight and 36.4% were obese and another 15.6% were in normal nutritional condition, but a small part (6.4%) were in morbidity obese condition. However, this situation could not interpreted the normal conditions of the women, as it was calculated immediately after the birth and at this period the body weight did not lose as expected normal health condition.

Table-3 shows the cross relation between the respondents occupation and the BMI and indicated that housewives were more BMI than the other service holders especially NGO service, but the doctors and engineers also high BMI. But as a whole point of view, there is no significant correlations (p>0.05) were observed between the respondent's occupation and BMI when the other socio economic factors were controlled. Table-4 shows the value of correlation r, is very poor (r=0.011) i.e. respondent's occupations were little influences on BMI.

Table-5 depicted that more than one third (34.0%) of the mother deliver low birth weight baby i.e. < 2.5 Kg, and about one third deliver 2.5 to 3.0 kg new born baby. Immediately after birth the nurse or doctor measure the Apgar score and it was observed that only 40.8% babies Apgar score was good as the score 8 to 10 is denoted better health condition. It was also noted that the complications arise during pregnancy and about one third (27.6%) of the pregnant women complain than there had been occurred some pregnancy related complications such as pre-eclampia, eclampia, toxemia, gestational diabetes mellitus, premature delivery and obstructed delivery etc.

Table.1 Socio-demographic features of the respondent from BIRDEM Hospital

Socio-demographic features	Frequency	Percentage
Age in Years		
≤ 20	10	4.0
21-25	58	23.2
26-30	92	36.8
31-35	59	23.6
≥36	31	12.4
Religious		
Muslim	216	91.6
Hindu	16	6.4
Christian	5	2.0
Education level		
Illiterate	3	1.2
Primary	13	5.2
Secondary (Class 1-5)	13	5.2
Secondary (Class 6-10)	24	9.6
SSC Passed	86	34.4
H.S.C	70	28.0
Graduate and above	41	16.4
Occupation		
Teacher		
Housewife		
NGO service holder	7	2.8
Doctor/Engineer	198	79.2
Business	8	3.2
others	22	8.8
	2	0.8
	13	5.2
Monthly Family income (Tk.)		
5,000- 10,000	8	3.2
10,001-20,000	38	15.6
21,001-30,000	46	18.4
30,001-40,000	41	16.4
40,001-50,000	41	16.4
50,001-60,000	42	16.8
>60,000	34	13.6
Respondent's Age, Mean ± SD	28.9 ± 4.9	
Monthly Family Income (Tk.) Mean ±SD	42,034.40±18,903.86	

Table.2 Nutritional status of the respondents according to Body Mass Index (BMI)

BMI	Nutritional status	Frequency	Percentage
17.00 – 18.49	CED_1(mild)	0	0.0
18.50 – 21.75	Normal -I	2	0.8
21.76- 24.99	Normal-II	39	15.6
25.00 – 29.99	Over weight	102	40.8
30.0-39.99	Obese	91	36.4
≥40.0	Morbidity obese	16	6.4
Total	**-**	**250**	**100.0**

Table.3 Relations between the respondent's occupation and the nutritional
status (BMI) by cross tabulation

	BMI				
Respondent's	**18.5-21.74** **n (%)**	**21.75-24.99** **n (%)**	**25-29.99** **n(%)**	**30-39.99** **n(%)**	**≥ 40** **n(%)**
Teacher	0 (0.0)	0 (0.0)	3 (1.2)	4 (1.6)	0 (0.0)
Housewife	2 (0.8)	34 (13.6)	83 (33.2)	65 (26.0)	14 (5.6)
NGO service holder	0 (0.0)	1 (0.4)	5 (2.0)	2 (0.8)	0 (0.0)
Doctor/Engineer	0 (0.0)	3 2(1.2)	5 (2.0)	13 (5.2)	1 (0.4)
Business	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.8)	0 (0.0)
Others	0 (0.0)	1 (0.4)	6 (2.4)	5 (2.0)	1 (0.4)
Total	**2 (0.8)**	**39 (15.6)**	**102 (40.8)**	**91 (36.4)**	**16 (6.4)**

Table.4 Correlations between respondent's occupation and nutritional status (BMI) of the
mother immediately after delivery

Control Variables		Respondent's occupation	
Socio economic factors such as monthly income, age, religion & educational qualification etc	**BMI**	Correlation (r)	0.011
		Significance (2-tailed)	0.869
		df	245

Table.5 Distribution of the respondent by their condition during pregnancy

Outcome of pregnant mother	Frequency	Percentage
Birth weight of the baby		
≤ 2.50	85	34.0
2.5-3.0	82	32.8
3.1-3.5	49	19.6
3.6-4.0	34	13.6
Apgar score		
$5^1, 6^5$	1	0.4
$5^1, 7^5$	16	6.4
$6^1, 7^5$	37	14.8
$7^1, 8^5$	93	37.2
$7^1, 9^5$	1	0.4
$8^1, 9^5$	63	25.2
$9^1, 10^5$	39	15.6
Arise complications during pregnancy		
Yes	79	27.6
No	171	72.4
complications arise during pregnancy		
Eclamptia/ preeclampia toxemia	63	25.4
GDM	47	18.9
Obstructed labor	44	17.8
Premature delivery	32	12.7
Pregnancy induced hypertension	36	13.9
Intra uterine fetal problems	28	11.3
Regular check up		
Yes	146	58.4
No	104	41.6

Table.6 Relations between the monthly income and birth weight by cross tabulation

Monthly income (Tk.)	Birth weight in Kg				
	<2.5 **n (%)**	**2.5-3.0** **N (%)**	**3.1-3.5** **n (%)**	**3.6-4.0** **n (%)**	**Total**
5,000- 10,000	6 (2.4)	2 (0.8)	0 (0.0)	0 (0.0)	8 (3.2)
10,001-20,000	22 (8.8)	11 (4.4)	5 (2.0)	0 (0.0)	38 (15.2)
21,001-30,000	15 (6.0)	24 (9.6)	3 (1.2)	4 (1.6)	46(18.4)
30,001-40,000	15 (6.0)	12 (4.8)	7 (2.8)	7 (2.8)	41 (16.4)
40,001-50,000	6 (2.4)	15 (6.0)	12 (4.8)	6 (2.4)	39 (15.6)
50,001-60,000	9 (3.6)	11 (4.4)	13 (5.2)	9 (3.6)	42 (16.8)
>60,000	11 (4.4)	7 (2.8)	9 (3.6)	7 (2.8)	34 (13.6)
Total	**85 (34.0)**	**82 (32.8)**	**49 (19.6)**	**34 (13.6)**	**250 100.0)**

Table.7 Correlations between monthly income and birth weight of the Baby

Control Variables		Monthly Income	
Socio economic factors such as occupation, age religion & educational qualification etc	**Birth Weight**	Correlation (r)	0.158*
		Significance (2-tailed)	0.013
		df	244

Table.8 Cross tabulation between the monthly income and nutritional knowledge about balanced diet and their practiced

Monthly income (Tk.)	Proper knowledge about balanced diet n (%)	Regular intake vitamin A rich foods n (%)	Regular intake iron rich foods n(%)	No superstition or misbelieve n(%)
5,000- 10,000	7 (2.8)	0 (0.0)	4 (1.6)	0 (0.0)
10,001-20,000	37 (14.8)	1 (0.4)	20 (8.0)	1(0.4)
21,001-30,000	30 (12.0)	22 (8.8)	35 (14.0)	3 (1.2)
30,001-40,000	26 (10.4)	18 (7.2)	35 (14.0)	2 (0.8)
40,001-50,000	27 (10.8)	19 (7.6)	34 (13.6)	1 (0.4)
50,001-60,000	24 (9.6)	23 (9.2)	37 (14.8)	2 (0.8)
>60,000	14 (5.6)	19 (7.6)	32 (12.8)	0 (0.0)
Total	**165 (66.0)**	**102 (40.8)**	**197 (40.8)**	**9 (3.6)**

Table-5 also shown the types of these kinds of complications and among them the mostly occurring rate was pre-eclampia/ eclampia- 25.4%, GDM-18.9% obstructed labor 17.8%, premature delivery 12.7%, prergnancy induced hypertension-13.9% and intra-uterine fetal problems -11.3% mainly. Among them about sixty percent (58.4%) pregnant women regular check up their body and others were check intermittently.

Table-6 shows the cross relation between monthly income and birth weight of the baby and indicated that higher monthly income increases the birth weight of the baby and table 19 shows a significant correlation ship between them (p=0.013) although the partial correlation coefficient r=0.158.

Table-7 shows the correlation ship between monthly income and birth weight of the baby and indicated that a significant correlation ship were observed between them (p=0.013) although the partial correlation coefficient r=0.158. If other things remain constant or control, when the monthly income increases then the birth weight of the baby increases.

Table-8 shows the relation between monthly income and nutritional knowledge about food and nutrients and their practiced of the mother and cross related more knowledge about balanced diet and more intake of regular vitamin A and iron were observed in lower and medium monthly income range Tk.10,000 to 30,000. Again, lower intake of vitamin A and iron were observed in higher income group which indicates the negative correlation ship between the monthly incomes.

Good nutritional status during pregnancy is extremely important. Not only does dietary intake influence pregnancy outcome for both mother and child, but it also has a direct impact on future lactation performance. Pregnant mother's nutritional requirement should meet her own daily needs provide enough nutrients for the fetus. In every society there are some preference, belief, ideas and interests about food intake of pregnant mother. Traditionally these beliefs are inseparable from social, cultural and religious factors of our country. It is recognized that all these factors are deeply involved in all the affairs of human health and sickness. Irrespective of rural and urban areas, majority of our people lack of knowledge of nutrition. Special attention should be given to the overall composition of a pregnant woman's diet, which should be mixed and varied to ensure an adequate intake of protein, vitamins and other essential nutrients. Cultural taboos notwithstanding, there is generally no need to avoid any specific foods during pregnancy.

References

Bangladesh Demographic Health Survey (BDHS)., 1999-2000. National Institute of Institute of Population Research and Training, Dhaka, Bangladesh. pp. 140-145.

Harrison, K., 1985. Child-bearing, health and social priorities: a survey of 22,774 consecutive hospital births in Zaria, Northern Nigeria. Br .J. Obstet. Gynaecol. 92 :1 - 119.

Hobbins, J.C., E.A. Reece, S. Gabrielli, M.T. Cullen, X. Zheng and Harris, E.N. 1990. Recurrent adverse pregnancy outcome and antiphospholipid antibodies. American Journal of Obstetrics and Gynecology.

ICDDRB., 1999. A report based on the International Low Birth Weight. Symposium and Workshop held on 14-17 June 1999 at the International Centre for Diarrheal Disease Research in Dhaka, Bangladesh. pp. 24-30.

Jordan, E.A., and Sloan, N.L. 1991. The prevalence of anemia in developing countries, Mother Care Working Paper 7B. Arlington, USA: John Snow, Mother Care Project.

Royston, E., 1982. The prevalence of nutritional anemia in women in developing countries: a critical review of available information. World Health Stat. 35:52 - 9.

Shams, E.l., and Arifeen. 1997. Birth weight, intrauterine growth retardation and pre maturity: a prospective study of infant growth and survival in the slum of Dhaka, Bangladesh

WHO., 1997. National reports on the third evaluation of the implementation of "Health for All" strategies. New Delhi: WHO Global Database.