Original Research Article

Dietary Practice among Pregnant Women at a Selected Hospital in Dhaka

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Abstract

Background: Dietary practice of women during pregnancy is critical for optimal growth and development of the fetus. Maternal and child health is strongly associated with dietary practices. Good maternal nutrition is important for the health and reproductive performance of women and development of their children. This study aimed to describe the dietary practice among pregnant women at Bangabandhu Sheikh Mujib Medical University Hospital (BSMMUH) in Dhaka. *Methods:* A descriptive cross sectional study was conducted to assess the dietary practice among pregnant women attending at the antenatal care unit (ANC) in BSMMUH. A total of 112 participants were conveniently selected using a standard equation. The data were collected during February to March 2022 from the eligible participants using a structured questionnaire containing socio-demographic section along with a validated dietary behavior questionnaire (DBQ). Both descriptive and inferential statistics were used to analyze the data. The inferential statistics, Pearson's product moments correlation, independent t- test, and one-way ANOVA were used to test the relationship between socio-demographic characteristics and output variable regarding dietary behavior. *Results:* The study showed the dietary practice of pregnant women were significantly related with their age (f=3.50, p=0.033), education (f=3.32, p=0.023), monthly family income (r=0.52, p=0.001), gestational age (r=0.32, p=0.008), BMI (f=8.89, p=0.000), and number of antenatal visit (r=0.30, p=0.000). *Conclusion:* The dietary practice of pregnant women is related with number of antenatal visits and education that might promote through appropriate interventions by the nurses and other health care personnel to improve maternal nutrition.
Keywords: Diet, Dietary practice, Pregnancy, Nutrition.

INTRODUCTION

Pregnancy is the most crucial nutritionally demanding period of every woman's life. Appropriate nutrient intake during this period has an acute role in fetal development and better maternal nutritional status [1]. During pregnancy, it is essential that a nutrient-rich diet is consumed to meet specific macro and micronutrient requirements, for example, carbohydrate, fat, protein and calcium, folic acid, iron, and zinc for fetal development [1]. It was reported that adequate maternal weight gains during the second and third trimester of pregnancy is essential to support the growth of the fetus [2]. Furthermore, maternal dietary intake influences milk production [3] that meets the infant's nutritional needs.

Inadequate nutrients, on the other hand, play a seriously bad impact on the overall health status including the life expectancy of the mother and fetus [4]. An increased risk of metabolic disorders and birth defects is observed among pregnant women who are undernourished in the early stages of pregnancy [1]. Maternal malnutrition is the most common cause of indirect maternal deaths in which pregnant women with iron deficiency are at risk of hemorrhage, sepsis, and fatal condition [5]. Many studies have found a link between inadequate maternal nutritional status and adverse pregnancy outcomes, infant mortality, the risk of chronic diseases, and impaired mental development in later life [6]. Maternal micronutrient deficiencies also increase the risk of cognitive impairments in unborn children [7].

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Several factors influence the dietary practice of pregnant woman. A cross-sectional study showed that occupational status and educational level were significantly associated with women's dietary diversity score (WDDS) [5]. Combining the nutrients from food sources with dietary supplements and micronutrient intakes were found to be significantly higher among women in their 3rd trimester as compared to women in their 1st and 2nd trimesters [8]. Evidence suggests that pregnant women having financial difficulties have a lower intake of different micronutrients including niacin, pyridoxine, iron, zinc, magnesium, and potassium [9]. A systemic review reported that the pregnant adoslescent are less likely to take recommended nuritent in developed countries [10]. On the other hand, cultural beliefs and social values contribute in deprivation of pregnant women of good nutrition [6].

Bangladesh is one of the poorest and most densely populated countries in the world with a 16.2 % of low-birth- weight [11] and 58.9% of prevalence of preganant womans' anemia [12]. Given the number that maternal malnutrition in Bangladesh is a serious health issue and is the product of several complex factors, including adherence to food taboos and a patriarchal gender issue [13]. In addition, low family income, low educational level, and periodic food shortages have been found to be associated with inadequate dietary intake among rural habitants in Bangladesh [9]. Many previous studies have been published regarding pregnant women's different aspects like dietary guidelines [14], knowledge and practices [15, 16], malnutrition [17], health [18, 19] and nutritional status [1]. Several studies have also been conducted on the dietary status of women in various countries like Ethiopia [20], Sri Lanka [16] and Bangladesh [21, 22, 9]. Despite these studies, much research in underdeveloped countries, such as Bangladesh has concentrated on merely determining dietary statuses following a constructive framework and using quantitative measurements. Identifying the maternal dietary practice is necessary and critical to designing the right intervention. Thus, this study aimed to assess dietary practices and associated factors of pregnant women in Dhaka.

METHODOLOGY
This descriptive cross sectional study was conducted among 112 pregnant woman attending at antenatal care (ANC) unit in Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital, Dhaka, Bangladesh. G* power analysis was used for calculating the sample size. In that analysis, accepted medium effect size was 0.30, significance (α) was 0.05 and a minimum power was (1-β) 0.80, thus calculated sample size was 84 [23] . Due to the potential risk of dropout, an attrition rate of 20% was added, and thus the final sample came to 112. About 16 weeks to 40 weeks' pregnant woman who had at least one ANC visit were included as the study participants but who had severe illness and were reluctant to take part were excluded from this study.

The data was collected through a face to face interview by using a structured questionnaire. The questionnaire had two parts. The first section was designed to obtain participants' socio-demographic information such as age, religion, level of highest education, occupation, living status, monthly family income, eating with other family member, gravida, gestational age, height, weight, checking of Hb%, number of antenatal visits and feelings of appetite. The second section, on the other hand, contained Dietary Behavior Questionnaire (DBQ) for measuring dietary behavior of pregnant woman which was validated by a prior study [24]. This DBQ consisted of 21 items in 3 aspects for instance, 11 items for quality diet, 4 items for supplementary diet, and 6 items for avoiding diet. The higher number was indicated the higher dietary practice. The Cronbach's alpha coefficient of the original study was 0.82 and in this study it was 86.2. These questionnaires were developed in English and translated into Bengali versions by a bilingual expert.

Following data collection, it was entered, cleaned, and analyzed using the IBM SPSS program version 23. The data was analyzed using both descriptive and inferential statistics. Data were presented in descriptive statistics as frequencies, percentages, means, and standard deviations to describe the characteristics and dietary practices of the participants. Pearson's product moments correlation was used to examine the relationship between participants' socio- demographic and pregnancy-related characteristics such as age, monthly income, education, living status, and dietary behavior. To test the differences in dietary practice between occupation, eating with others, and dietary practice, two samples t-tests were used. The one-way ANOVA was used to test for differences in dietary practice based on socio-demographic and pregnancy-related characteristics, educational levels, living status, gravida, BMI, and feelings of appetite of respondents.

Prior to begin the study, the researchers sought consent from the Institutional Review Board (IRB) of National Institute of Advanced Nursing Education & Research (NIANER) and Bangabandhu Sheikh Mujib Medical University (BSMMU) in Dhaka, Bangladesh. Permission was obtained from the Director of Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital via a written permission form for utilizing this hospital as this study's place. Participants both verbal and written consent were also taken after explaining the aim of this study and ensuring the confidentiality and anonymity. The consent form was translated into Bengali language for avoiding error in data collection.

RESULTS

This part study of the study represents the socio demographic and pregnancy related characteristics of pregnant woman and their distribution on the basis of dietary practices. Also, the association between pregnant women's socio-demographic and pregnancy-related characteristics and dietary practices can be observed from this section of research.

Table 1: Distribution of socio demographic and pregnancy related characteristics of pregnant women (N=112)

Variables	Categories	n	%	M±SD
Age (Years)	<18	5	4.5	27.76 ± 5.06
	18 - 28	58	51.8	
	>28	49	43.8	
Religion	Muslim	91	81.3	
	Non-Muslim	21	18.8	
Level of highest education	Primary education	25	22.3	
	High school	44	39.3	
	College or more	43	38.4	
Occupation	Housewife	85	75.9	
	Service	27	24.1	
Living status	Living with spouse	81	72.3	
	Living with spouse's parents' family	23	20.5	
	Living with parent	8	7.1	
Monthly family income (Bangladeshi taka)	Min=15000, Max=80000,			40142.82 ±16093.09
Eating with other	Yes	102	91.1	
	No	10	8.9	
Gravida	Primi gravida	40	35.7	
	Multi gravida	69	61.6	
	Grand Multi Gravida	3	2.7	
Gestational age (weeks)	Min=16, Max=38,			28.35± 4.91
Body Mass Index in pregnancy	Normal	62	55.4	
	Overweight	45	40.2	
	Obese	5	4.5	
Hemoglobin percentage	Min= 9, Max=13			10.2 ± .82
Number of antenatal visits	Min=2, Max=11			4.79 ± 2.53
Feel of appetite	Poor	16	14.3	
	Good	87	77.7	
	Very good	9	8.0	

The demographic and pregnancy related characteristics of 112 respondents can be observed from Table 1. The mean age of the pregnant women was 27.76 (SD=5.06) years where most of them were Muslim (81.3%), high school certificate holders (78%), housewives (76%) and living with their husbands (72.3%), respectively. The mean family monthly income was 40142.82 (SD=16093.67) BDT (Range from 15 to 80 thousands). On the other hand, the mean gestational age was 28.35 (SD= 4.91) with the range of 16 to 38 weeks and the mean number of antenatal visit was 4.79 (SD=2.53). Almost two third (64.3%) of them was multi gravid. Regarding BMI, more than half (55.4%) of them reported as normal and mostly (85.7%) had reported good appetite to eat their daily meals.

Table 2: Distribution of pregnant women on the basis of dietary practices (N=112)

Variables	Never n (%)	Some times n (%)	Most of time n (%)	Always n (%)	M±SD
Quality diet					**2.35± .34**
I eat balanced diet including rice, fish, meat, vegetable, and fruits each day	-	1 (.9)	52 (46.4)	59(52.7)	2.52 ± .52
I eat well cooked food	-	-	11 (9.8)	101(90.2)	2.90 ±.29
I eat 1(one) egg every day	-	8 (7.1)	42 (37.5)	62 (55.4)	2.48 ±.62
I eat 3 meals per day	-	1 (.9)	6 (5.4)	105(93.8)	2.93 ±.29
I eat 2 big spoon of vegetable and 2 plate of rice per day	1 (.9)	4 (3.6)	24 (21.4)	83 (74.1)	2.69 ±.58
I drink about 8 glasses of water per day	-	-	38 (33.9)	74 (66.1)	2.66 ±.47

Variables	Never n (%)	Some times n (%)	Most of time n (%)	Always n (%)	M±SD
I eat snacks in between meals	1 (.9)	27(24.1)	49 (43.8)	35 (31.3)	2.05 ±.76
I eat green leafy vegetable and raw fruits e.g., olive, amloky, lemon, pulm, guava etc	2 (1.8)	34(30.4)	48 (42.9)	28 (25.0)	1.91 ±.78
I eat sea fish for good health	14(12.5)	48(42.9)	38 (33.9)	12 (10.7)	1.43 ±.84
I drink 1 glass of milk per day	8 (7.1)	42(37.5)	38 (33.9)	24 (21.4)	1.70 ±.88
I eat 1 tablespoon of oil daily	1 (.9)	3 (2.7)	35 (31.3)	73 (65.2)	2.61 ±.59
Supplementary diet					**2.38± .42**
I eat extra food that has iron e.g., green leafy vegetable	-	4(3.6)	32 (28.6)	76(67.9)	2.64±.55
I take iron and multivitamin tablet each day	1 (.9)	1(.9)	25 (22.3)	85(75.9)	2.73±.52
I take vitamin A containing diet e.g., yellow banana, pumkin, papaya each day	-	13(11.6)	70 (62.5)	29(25.9)	2.14±.59
I take calcium rich diet e.g., milk, small fish each day	-	33(29.5)	46 (41.1)	33 (29.5)	2.00±.77
Avoiding diet					**2.70± .28**
I don't take more sweet and fatty food	5 (4.5)	12(10.7)	41 (36.6)	54 (48.2)	2.29±.83
I don't eat more salty diet	3 (2.7)	3(2.7)	37 (33.0)	69 (61.6)	2.54±.68
I don't eat unclean and uncooked food	-	-	2 (1.8)	110(98.2)	2.98±.13
I don't eat charcoaled food (Burn wood, burn soil etc.)	-	-	-	112 (100)	3.00±.00
I don't take / drink tea or coffee in pregnancy	2 (1.8)	10(8.9)	35 (31.3)	65 (58.0)	2.46±.73
I don't take gul, betel leaf etc.	-	-	6 (5.4)	106(94.6)	2.95±.22
Total M±SD (DBQ)	**2.46 ±24**				

Table 2 shows the distribution of frequency, percentages, mean, and SD of dietary practice among pregnant women. The result presents that the mean dietary score of the dietary practice of pregnant women was calculated as 2.46 (SD=0.24). There were three categories of dietary behavior questions of participants, and the mean for quality diet was 2.35(SD=0.34), for supplementary diet was 2.38 (SD=0.42) and for avoiding diet was 2.70 (SD=0.28). The highest dietary behaviors in this study found that the mothers avoided eating any charcoaled food (100%); unclean and uncooked food (98.2%); betel leaf or using gul (94.6%); eat 3 meals per day (93.8%), eat well cooked foods (90.2%), and take iron and multivitamin tablet each day (76%). However, the least dietary behaviors are reported as eat sea fish for maintain good health (10.7%); drink 1 glass of milk per day (21.4%); eat snacks in between meals (31.3%); and eat green leafy vegetable and raw fruits (25%). Other dietary behavior was reported that more than half (52.7%) of them had taken balanced diet including rice, fish, meat, vegetables and fruits on daily basis. (62%) participants had eaten one egg daily, (67.9%) had eaten extra iron rich food, (66.1%) had drunk about 8 glasses of water per day and (61.6%) didn't eat extra salty foods.

Table 3: Relationship between socio demographic and pregnancy related characteristics and dietary practice of pregnant women (N=112)

Variables	Categories	M ± SD	f/ r / t	p
Age (Years)	<18	2.29 ± .13	3.50	.033
	18-28	2.42 ± .26		
	29-39	2.52 ± .22		
Religion	Muslim	2.45 ± .24	0.29	.767
	Non-Muslim	2.47 ± .27		
Level of highest education *	Primary education[a]	2.38 ± .27	3.32	.023
	High school[b]	2.43 ± .25		
	College or more[c]	2.53 ± .21		
Occupation	Service holder	2.44 ± .25	1.48	. 148
	Housewife	2.52 ± .23		
Living status	Married and living with spouse	2.48 ± .23	2.31	.104
	Married and living with spouse parents	2.36 ± .28		
	Married and living with parents	2.53 ± .29		
Monthly family income			0.52	.001
Eating with other family members	Yes	2.47 ± .23	1.98	.049
	No	2.31± .32		
Gravida	Primi gravida	2.42 ± .25	1.29	.278

Variables	Categories	M ± SD	f/ r / t	p
	Multi gravida	2.48 ± .24		
	Grand Multi Gravida	2.52 ± .19		
Gestational age			**0.32**	**.008**
Body Mass Index in pregnancy[**]	Normal[a]	2.38 ±.24	8.89	.000
	Over weight[b]	2.57 ± .22		
	Obese[c]	2.44 ± .10		
Hemoglobin percentage (Hb%)			**0.38**	**.001**
Number of ante- natal visit			**0.30**	**.000**
Feel of appetite[***]	Poor[a]	2.31 ± .17	3.42	.036
	Good[b]	2.49 ± .25		
	Very good[c]	2.47± .18		

*c>b & a; **b> c & a; *** b> c & a

It is found that the age (f=3.50, p=0.033), the level of highest education (f=3.32, p=0.023), monthly family income (r=0.52, p=0.001), eating with other family members (t =1.98, p=0.049) gestational age (r=.32, p=0.001), BMI (f=8.89, p=0.000), Hb% (r=0.38, p=0.001), number of antenatal visits (r=.30, p=0.000) and feeling of appetite (f=3.42, p=0.036) were significantly associated with dietary behavior of pregnant women. In contrast, religion (f=0.29, p=0.767), occupation (f=1.48, p=0.148), living status (f=2.31, p=0.104) and gravida (t=1.29, p=0.278) were not associated with dietary behavior of pregnant women.

DISCUSSION

This study tried to look at the dietary practices and its influencing factors upon pregnant woman in a selected hospital in Dhaka, Bangladesh. In order to accomplish the study's aim, a standard Dietary Behavior Questionnaire (DBQ) blended with socio-demographic question was applied among the selected pregnant woman attending in the antenatal care unit of Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital, Dhaka, Bangladesh.

This study found that the study subjects' average dietary practice was 2.46. This average score for dietary habits increased with age, educational qualification and the number of giving births of the participants of this study. A possible reason behind this could be that highly educated pregnant women may had managed their diet by getting various information about food during pregnancy through social, print or electronic media or text books. On the other hand, with age, people's experiences increase and people tend to take more care of themselves, so it is possible that the mean score of dietary practices increased with the age and the number of giving births of the participants of this study. Hence, awareness raising programs based on age and literacy rate should be planned and implemented in targeted areas across the country.

Like some previous studies [9, 24], majority of the pregnant women of this study had three meals per day, well- cooked foods, and taken supplementary iron and multivitamin. In addition, most of the respondents had avoided unclean, uncooked and charcoaled food which might be a sign of good dietary practice. In contrast, below one quarter of participants had drunk milk regularly which shows their poor dietary practices since milk consumption is directly associated with height in children. Though the pregnant women are recommended to take one egg daily to meet their nutrition regimen, however, the current study reported that more than one-third of the participants did not consume one egg daily. Market prices of milk and eggs beyond the reach of affordability or ignorance of the importance of these foods during pregnancy may contribute to get such results. Government subsidies on milk and eggs for pregnant women can ensure these foods to all expectant mothers.

Concerning socio-demographic, pregnancy-related, and dietary practice the findings found that the socio- demographic characteristics of age, level of education, monthly family income, eating with other family members, gestational age, BMI, Hb%, number of antenatal visits, and feel appetite was significantly associated with the dietary practice of pregnant women.

The current study showed that pregnant women dietary practices increased with the age which is consistent with prior studies [25, 26]. Furthermore, there was a link between monthly family income and dietary practice. Similarly, one study found that a higher income is associated with a higher quality of diet [4]. A higher income may mean more purchasing power for higher-quality foods, whereas a lower income may limit access to nutrient-dense foods.

BMI and Hb% are the two important indicators of nutritional status of pregnant women since authors from two different countries found significant relationship between dietary practices, nutrition status, and maternal weight gain during pregnancy [27, 28] which was also found positively associated with the dietary practices of this study subjects. On the other hand, the number of antenatal visits was also found correlated with dietary practice of the present study participants. During the antenatal visit, pregnant women could receive nutrition information, which could

increase dietary practice. In the promotion of nutrition during pregnancy, nurses can play an important role as they are considered the backbone of maternity services [29]. Arrish *et al.,* (2014) showed that nurses have a great opportunity to screen risks and provide nutritional information as they are the first contact that pregnant women have during antenatal visits [30]. Nana and Zema (2018) found that pregnant women who were exposed to nutrition information had better dietary habits than pregnant women who were not exposed [4]. Therefore, in order to promote the significance of nutrition during pregnancy, nurses who know about nutrition for pregnant women can be recruited or existing nurse can be transferred to the antenatal department by imparting knowledge about nutrition to pregnant women.

Family members largely influence eating behavior and practices during pregnancy. The present study found a strong relationship between eating with other family members and the dietary practice of pregnant women which is supported by a previous author's report [31]. Regarding the relationship between gestational age, appetite and eating habits of pregnant women, this study found a positive strong relationship. Dietary practice is usually increased who have more gestational age and appetite together. One author reported that food cravings of pregnant women in the third trimester are much higher than in other trimesters [32]. This study is also found positive association among hemoglobin concentration with dietary behavior. Improvement of dietary intake and enhanced iron folic acid compliance and increased consumption of green leafy vegetables which are locally available in this country may contribute to improve the diet quality of pregnant women.

CONCLUSION
Several interconnected factors have a significant impact on pregnant women's dietary habits. The study found that women of a higher age and education had better dietary habits. Women who are more knowledgeable about nutrition and pregnancy outcomes may be more concerned. As a result, effective nutrition information should be directed towards pregnant women during the antenatal visit in order to improve maternal nutritional statuses, such as having a higher number of antenatal visits and early initiation of seeking health care, which leads to better exposure to a balanced diet during pregnancy. The current study found that the number of antenatal visits has a positive impact on pregnant mothers' dietary habits. In this regard, the outcome will be beneficial to nurses. During the antenatal visit, nurses and health care providers can play an important role in providing adequate information about dietary practices to pregnant women. Increasing educational attainment and increasing the number of antenatal visits may improve maternal dietary practices as well as fetal well-being.

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