

Impact of dietary behavior on the nutritional status of middle-aged pregnant women

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Abstract

The maternal diet is a vital factor to ensure the health and nutrition of the mother during pregnancy and for the upcoming child. During pregnancy, women's nutritional needs increase to fulfill the extra demand of their bodies. Therefore, this study was conducted to investigate the relationship between dietary behavior and the nutritional status of middle-aged pregnant women in Bangladesh. A technical cross-sectional study was conducted on middle-aged pregnant women at a tertiary hospital in Dhaka. By following a simple random sampling method, 114 pregnant women aged 30 years or above were selected for the study. Data collection was done in January-February of 2022 by conducting a face-to-face interview. The findings reveal that most (35.49%) of the pregnant women were aged between 35 to 38 years. Among all, more than three-fourths (77.07%) of the respondents had food security. A total of 16.38% of respondents used to consume from 7 or more food groups whereas more than two-thirds (64.68%) of the respondents had an acceptable food consumption score. The nutritional status of the respondents was significantly associated with their dietary behavior in terms of the three indicators. Pregnant women at risk of food insecurity should be identified as soon as possible (preferably before conception) and first get food assistance in the form of food baskets or food stamps through social security programs. Therefore, it can be recommended that women's empowerment can improve women's mental health, food insecurity, and improved nutrition at the family level.



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Introduction

Both before and during pregnancy, a woman's nutrition is essential for her health and the well-being of her unborn children. Pregnancy nutrition and a balanced diet can enhance birth outcomes and lower the risk of the unborn child growing up with disorders like obesity and heart disease. The right food and nutrition are crucial for survival, physical development, mental growth, performance, and productivity in addition to health and well-being (Kibr, 2021). Poor eating patterns have been connected to pregnancy-related issues such as gestational diabetes, hypertension, and postpartum depression. Intrauterine exposure to fetal malnutrition is defined as inadequate or excessive nutrition is linked to several health effects, including delayed fetal growth, low or high birth weight, obesity, and a higher risk of chronic disease in adulthood (Deierlein et al., 2021). Previous studies have demonstrated that maternal malnutrition, which persists at an alarming rate, is one of the risk factors for malnutrition in children under the age of five. The immunological dysfunction of mothers has a causal impact on infant feeding. The metabolic cost of the growing baby rises due to decreased transfer of maternal immune defenses, increased exposure to infections, and pro-inflammatory mediators, which contributes to the pathophysiology of malnutrition (Muze et al., 2020). The word "dietary behavior," as well as terms like "dietary regimen," "nutrition," "eating," "eating behavior," "eating habits," and "food choice," are ambiguous general concepts that are frequently used in research. This comprises a wide range of frequently clustered qualitatively diverse results. These studies span all facets of eating behavior, from food seeking through food intake, and extend from general eating patterns to nutrient intake on an individual level. They also address irregular eating, eating habits, food preferences, and meal preparation (Marijin et al., 2018). In this study, three indicators—food security, dietary diversity, and food consumption score—were used to display the respondents' eating behavior. Middle age is a time when the body needs an additional supply of nutrients due to the growing needs, especially for women. There is no study in Bangladesh to describe the association of BMI with the dietary pattern of middle-aged pregnant women. Considering the facts, this study was conducted to get some information about the dietary behavior of middle-aged pregnant women in Bangladesh and its association with their nutritional status.

Literature review

Food insecurity can be caused by a lack of adequate access to wholesome nutrients or by the inability to eat particular foods in morally righteous ways. When everyone has constant access to enough wholesome food to suit their nutritional needs and food preferences for an active and healthy lifestyle, food security has been achieved. Home food insecurity can seriously harm a woman's health, particularly during pregnancy. Prenatal nutrition has a significant impact on the mother's health, the health of the fetus, and the health of future children and adults. Food instability and scarcity have a severe impact on women's general, mental, and physical health (Moafi et al., 2018). Food insecurity during pregnancy increases the risk of obesity in both moms and children (Crandall et al., 2020). Certain micronutrient deficiencies in pregnant women continue to be a serious public health issue in low- and middle-income countries. Controlling the food is the most crucial strategy for addressing macro- and micronutrient deficits during pregnancy. Dietary diversity, which is defined as the variety of foods or food groups ingested during a specific baseline time, is an indicator of nutritional quality and nutritional adequacy during pregnancy and breastfeeding. Pregnant women should therefore eat a variety of foods from different food groups that are high in vitamins, minerals, protein, energy, and water. Micronutrient deficits pose a concern to expectant mothers, particularly in low- and middle-income nations (Gudeta et al., 2022). Because their diets are repetitive, primarily comprised of cereal, and contain little to no nutrient-rich animal products, fruits, and vegetables, the majority of pregnant women in impoverished nations do not fulfill the WHO-

recommended nutritional guidelines. In less-developed countries, two-thirds of pregnant mothers have nutritional anemia. South Asian nations are responsible for 52.5% of anemia in pregnant or nursing women (Gudeta et al., 2022). According to the 2016 Ethiopian Demographic Health Survey (EDHS), a substantial portion of Ethiopian women are fat, and more than one-fifth of them are skinny and anemic as a result of poor food intake, little nutritional variety, and changing lifestyles (Gudeta et al., 2022). The Food Consumption Score (FCS), a food frequency indicator, was developed by the World Food Programme to capture both diet quantity and quality of household food consumption. Food consumption in the right quantity and quality is crucial for a healthy and fruitful life. According to the diversity in diet, consumption, and nutritional content of the items, a composite score known as FCS is calculated (Fite et al., 2022). FCS can be a useful resource for information about people's diets, particularly for pregnant women, to assist in the design of a nutrition-sensitive program (Ambaw et al., 2021). Pregnant women, their guardians, health care professionals, and policymakers can adopt healthy eating habits with less effort if poor dietary patterns are identified early on.

Method

With the participation of middle-aged pregnant women who live in Bangladesh's Dhaka metropolis, a cross-sectional study was conducted. The study was conducted in a tertiary hospital where women used to go for antenatal care. Following the statistical procedure, the sample size for this study was determined to be 114 and was estimated in a 95% confidence interval. Women who agreed to participate in the study and were 30 years of age or older were chosen. To gather pertinent data from the study participants, a questionnaire was created. Data was gathered during January and February 2022. Vigorous review, checking, and cross-checking was used to ensure quality. Data entry and data gathering were carried out simultaneously. Stata and SPSS (version 24) were used for data analysis (Version 13). By gathering data on the number of days the household consumed a range of meals in the week before data collection, household food consumption patterns were discovered. The weight of the food groups is determined by how important they are nutritionally. A nutritionally balanced diet requires daily consumption of all 12 food categories, which are categorized into the past 24 hours of household food consumption (day and night). The frequency or number of days that a portion of food from each food category was consumed is tallied for each food group as either 0 (not eaten) or 1. (eaten). The Household Dietary Diversity Score (HDDS) is determined based on the scores (from 0 to 15) obtained by the household in the last 24 hours (day and night) (Swindale et al., 2006). Before conducting the study, the Research Ethics Review Committee of the Daffodil International University Affiliated Faculty of Allied Health Sciences provided ethical approval and oral informed consent was collected from study participants before data collection. Anonymity and confidentiality were strictly respected.

Results

Among all the respondents, most women (35.49%) were aged between 35 to 38 years. A total of 34.87% of women were aged between 39 to 42 years and the rest (29.64%) were aged between 30 to 34 years. Most (38.87%) of the respondent's families had 5 to 7 members. Among all the 114 respondents, more than forty percent (42.99%) of the study participants were educated up to graduation or above whereas only 3.69% had no formal education at all (Table 01).

Table 01: Socio-demographic characteristics of the respondents (n=114)

Socio-demographic variables	Frequency	Percentage
Age group		
30 to 34	34	29.64
35 to 38	40	35.49
39 to 42	40	34.87
Family size		
<5	41	36.34
5 to 7	44	38.87
>7	28	24.79
Level of education of the respondents		
No formal education	4	3.69
Primary	16	13.84
Secondary	21	18.09
Higher Secondary	24	21.39
Graduate or above	49	42.99

According to the obstetrics characteristics of the respondents, more than half (52.27%) were in their third trimester. A total of 86.09% of respondents' parity was above 2 whereas about ninety percent (89.68%) of the respondents were multigravida (Table 02).

Table 02: Obstetric characteristics of the respondents (n=114)

Obstetric variables	Frequency	Percentage
Gestational week		
1 st trimester (1-12 weeks)	6	4.86
2 nd trimester (13-27 weeks)	49	42.87
3 rd trimester (28-40 weeks)	60	52.27
Parity		
0 to 2	16	13.91
>2	98	86.09
Number of pregnancies		
Primigravida	12	10.32
Multigravida	102	89.68

The dietary behavior of the respondents was shown according to three indicators which are food security, diversity, and food consumption score. Among all the respondents, more than three-fourths (77.07%) of the respondents had food security whereas only 7.68% had severe food insecurity. A total of 16.38% of respondents used to consume from 7 or more food groups whereas 28.78% and 25.07% of respondents used to consume food from 5 and 6 food groups respectively. More than two-thirds (64.68%) of the respondents had an acceptable food consumption score whereas 7.37% had a poor food consumption score (Table 03).

Table 03: Dietary behavior of the respondents (n=114)

Dietary behavior	Frequency	Percentage
Food security		
Food secure	88	77.07
Mild/Moderate food insecure	17	15.25
Severe food insecure	9	7.68
Dietary diversity		
3 or fewer food groups	11	9.49
4 food groups	23	20.28
5 food groups	33	28.78
6 food groups	29	25.07
7 or more food groups	19	16.38
Food consumption score		
Poor food consumption	8	7.37
Borderline food consumption	32	27.95
Acceptable food consumption	74	64.68

The nutritional status of the study respondents was assessed using body mass index (BMI). More than forty percent (41.84%) of the respondents were found overweight whereas 30.73% of the total respondent's nutritional status was normal. More than one-fifth (21.57%) of the respondents were obese (Table 04).

Table 04: Nutritional status of the respondents according to BMI (n=114)

Nutritional status	Frequency	Percentage
Underweight (<18.5)	7	5.86
Normal weight (18.5-24.9)	35	30.73
Overweight (25.0-29.9)	48	41.84
Obese (\geq 30.0)	25	21.57

Discussion

The association of food security, dietary diversity, and food consumption score with the nutritional status of the respondents showed a significant association ($P < 0.05$) (Table 05).

Table 05: Association of the dietary behavior of the respondents

Dietary behavior	Frequency	Nutritional status				P value
		Undernutrition (7)	Normal (35)	Overweight (48)	Obese (25)	
Food security						
Food secure	88	1	21	43	24	0.018
Mild/Moderate food insecure	17	1	10	5	1	
Severe food insecure	9	5	4	0	0	
Dietary diversity						
3 or fewer food groups	11	2	6	2	1	0.024
4 food groups	23	1	11	9	2	
5 food groups	33	2	12	18	1	
6 food groups	29	1	4	14	10	
7 or more food groups	19	1	2	5	11	
Food consumption score						
Poor food consumption	8	4	3	1	0	0.039
Borderline food consumption	32	2	21	7	2	
Acceptable food consumption	74	1	11	40	23	

Household food security and recommended amount of nutrient intake is very important for the growth and development of the human body (Areba et al., 2022). According to this study's results, moderate food insecurity affected 15.25 percent of pregnant women whereas severe food insecurity affected 7.68 percent of them. In our study, 24 (27.27%) of the 88 pregnant women in the food-secured group were obese, while only 1 (1.13%) had undernutrition. Similar findings were found in a study where only 2.12% of food-secured people had undernutrition (Gelebo et al., 2021). In our study, undernutrition affects 5.88% of pregnant women with mild food insecurity and 55.55% of pregnant women with severe food insecurity. Similar results have been seen in research carried out in the Konso district of Southern Ethiopia, where 55.59% of pregnant women from families with food insecurity were suffering from undernutrition (Hasan et al., 2021).

Conclusion

It is important to identify pregnant women who are at risk for food insecurity as soon as possible (ideally before conception) and give them priority when it comes to receiving nutritional assistance from social safety net programs in the form of food baskets or food vouchers. In rural households in South Asia, especially Bangladesh, the involvement of women in decision-making and resource management is relatively low. Informed choices on daily routines, grocery shopping, dietary habits, self-sufficiency, and obtaining medical treatment for oneself and one's children are uncommon among rural women. Women's mental health is at

stake when they feel hopeless and powerless to improve their families. Women's mental health, food insecurity, and nutrition can all improve with the promotion of women's empowerment.

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Conflict of interest

No conflict of interest was declared by the authors of this study.

Consent for publication

All authors have given consent for the publication of this article.

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