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Effect of Nutrition Education Package on Pregnant Woman Knowledge and Healthy Dietary Practice

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ABSTRACT

This study investigated pregnant women's demographic characteristics, dietary patterns, and knowledge levels about nutrition during pregnancy. A total of 150 pregnant women attending antenatal clinics at Department (OPD) of Sono Hospital Limited, Kushtia and Sono Diagnostic Center, Bheramara, Bangladesh from October 2016 to October 2017 were included in the study. Demographic data revealed that the majority of participants (70.0%) were between 20 and 30 years old and had diverse educational backgrounds, including diplomas (40.0%) and university education (35.0%). Furthermore, 60.0% of participants were identified as housewives. Analysis of dietary patterns indicated varied consumption habits, with a notable proportion consuming red meat, chicken, and milk daily, while a significant percentage reported rarely consuming fruits and vegetables. Additionally, a considerable proportion of participants reported regular consumption of fast-food during pregnancy. Pre- and post-intervention knowledge assessments significantly improved participants' understanding of food items during pregnancy. Statistical analysis using Fisher's Exact Test revealed significant shifts in the percentages of participants providing complete, correct answers immediately after the intervention and during follow-up. These findings underscore the importance of targeted nutritional education interventions for pregnant women, focusing on promoting dietary diversity and micronutrient intake. Healthcare providers should prioritize personalized nutritional counselling and support to ensure optimal maternal and fetal health outcomes during pregnancy. Community-based initiatives to facilitate access to nutritious foods and promote healthy eating behaviours are also recommended to enhance overall maternal nutrition and pregnancy outcomes.

Keywords: Pregnant Women, Nutrition, Dietary Patterns, Knowledge Levels, Demographic Characteristics, Antenatal Care, Maternal Health, Dietary Diversity, Micronutrient Intake, Nutritional Education, Pregnancy Outcomes.

INTRODUCTION

Maintaining a healthy and balanced diet during pregnancy is crucial to support the optimal growth and development of the fetus and the physiological changes occurring in the mother's body. Key components of a healthy dietary regimen during pregnancy include consuming foods that provide adequate energy and essential macro and micronutrients, achieving appropriate weight gain, adhering to general and pregnancy-specific food safety guidelines, and avoiding ingesting harmful substances[1,2]. Research indicates that failure to adhere to such behaviours increases the risk of unfavourable pregnancy outcomes, such as preeclampsia, low birth weight, preterm birth, and neurodevelopmental issues like fetal alcohol spectrum disorder[3]. While most women understand the importance of healthy eating during pregnancy, many may lack knowledge of specific dietary recommendations or the skills needed to improve their dietary habits[4,5]. Healthy eating can be challenging during pregnancy due to various factors such as food aversions, nausea, vomiting, cravings, fatigue, constipation, hemorrhoids, and heartburn. Women often receive advice from multiple sources, including healthcare professionals, family members, and educational materials, influencing their dietary choices during pregnancy[6,7]. In the context of changing dietary patterns, challenges, and cultural variations, it is essential to consider the impacts and implications of nutrition for pregnant women. Nutrition education during pregnancy provides an ideal opportunity to promote adequate daily intake of folic acid and other pregnancy-specific nutrients. Educational interventions aimed at enhancing dietary intake during pregnancy have been shown to positively impact knowledge and nutritional habits, ultimately leading to improved outcomes for both mother and baby[8-10].

Materials and Methods

This study investigated pregnant women's demographic characteristics, dietary patterns, and knowledge levels about nutrition during pregnancy. A total of 150 pregnant women attending antenatal clinics at Department (OPD) of Sono Hospital Limited, Kushtia and Sono Diagnostic Center, Bheramara, Bangladesh from October 2016 to October 2017 were included in the study. A purposive sample of 150 pregnant women attending antenatal clinics was selected. Inclusion criteria comprised pregnant women in their first trimester, with a typical current pregnancy, and aged between 18 and 35.

Inclusion Criteria:

1. Pregnant women in their first trimester of pregnancy.
2. Pregnant women with a normal current pregnancy.
3. The age of pregnant women ranges between 18 and 35 years.

Exclusion Criteria:

1. Pregnant women in their second or third trimester of pregnancy.
2. Pregnant women with complications or medical conditions affecting pregnancy.
3. Pregnant women outside the age range of 18 to 35 years.

Data Collection: A structured interviewing questionnaire sheet was used to collect data on socio-demographic characteristics, including age, education, occupation, and income, as well as obstetric profiles such as last menstrual cycle, gestational age by weeks, anemia during current pregnancy, and antenatal care. Additionally, a structured interview schedule was employed to assess women's

knowledge regarding their dietary needs during pregnancy. This schedule included questions about the types of foods consumed most frequently, foods avoided during pregnancy, portion sizes of different food types during pregnancy, meal preferences, understanding of the importance of a balanced diet during pregnancy, sources of advice regarding nutrition, and experiences of fatigue or upset stomach during pregnancy. The scoring system for assessing women's knowledge categorized responses into complete, correct answers (scored 2), incomplete correct answers (scored 1), and "don't know" responses (scored 0), with a total knowledge score calculated out of 14. Additionally, a diet diary questionnaire consisting of open-ended questions was administered to participants, prompting them to list all foods, beverages, and supplements consumed during pregnancy, along with their frequency of consumption. Participants were instructed to respond using their own words, and multiple reasons for food choices were coded separately.

Data Analysis: For the descriptive design component of the study, descriptive statistics such as frequencies and percentages were used to analyze socio-demographic characteristics, obstetric profiles, and responses to the structured interview schedule on dietary knowledge. The total knowledge score was calculated and categorized into three levels based on the scoring system. Additionally, thematic analysis was conducted on the responses obtained from the diet diary questionnaire to identify patterns in food consumption behaviours during pregnancy. For the intervention design component, pre- and post-intervention comparisons of knowledge scores were conducted using appropriate statistical tests such as paired t-tests. Subgroup analyses were also performed to explore associations between demographic variables and knowledge scores. All data analyses were conducted using statistical software packages, with significance levels set at $p < 0.05$.

Results

Table 1: Demographic Characteristics of Pregnant Women Attending Antenatal Clinics

Items	NO	%
Age		
<20	10	10.0
20-30	70	70.0
>30	20	20.0
Educational levels		
Primary School	15	15.0
Secondary School	10	10.0
Diploma	40	40.0
University	35	35.0
Job-status		
Housewife	60	60.0
Employee	40	40.0
Total	100	100.0

The table-1 provides a frequency distribution of participants based on their demographic characteristics. Age categories include participants under 20 years, those between 20 and 30, and those older than 30, with corresponding percentages of 10.0%, 70.0%, and 20.0%, respectively. Educational levels are categorized into primary school, secondary school, diploma, and university, with percentages of 15.0%, 10.0%, 40.0%, and 35.0%, respectively. Regarding job status,

participants are classified as housewives or employees, with percentages of 60.0% and 40.0%, respectively. Overall, the table represents data from a total sample size of 100 participants.

Table 2: Frequency Distribution of Dietary Consumption Habits Among Pregnant Women

Variable	No.	%
Red meat consumption		
Two to three times/week	55	55.0
Three to four times/week	30	30.0
Daily	10	10.0
Rarely	5	5.0
Chicken consumption		
Two to three times/week	40	40.0
Three to four times/week	35	35.0
Daily	20	20.0
Rarely	5	5.0
Fish consumption		
Two to three times/week	30	30.0
Three to four times/week	15	15.0
Daily	10	10.0
Rarely	45	45.0
Fruit and vegetable consumption		
Two to three times/week	35	35.0
Three to four times/week	20	20.0
Daily	15	15.0
Rarely	30	30.0
Milk consumption		
Once/day	45	45.0
Two to three times/day	20	20.0
Three to four times/day	10	10.0
More than four times/day	5	5.0
Rarely	20	20.0
Sweets consumption		
Once/week	30	30.0
Two to three times/week	35	35.0
Three to four times/week	15	15.0
More than four times/week	10	10.0
Rarely	10	10.0
Fast food consumption		
Yes	60	60.0
No	10	10.0
Sometimes	30	30.0
Sports activity		
Once/week	20	20.0
Twice/week	15	15.0
Three times/week	5	5.0
Rarely	60	60.0

This table-2 presents the frequency distribution of participants' behaviours related to dietary patterns during pregnancy. It indicates the percentage of participants engaging in various consumption habits, including red meat, chicken, fish, fruits and vegetables, milk, sweets, and fast food. Additionally, it shows the percentage of participants involved in sports activities during pregnancy.

Table 3: Effect of Intervention on Knowledge Levels Regarding Food Items during Pregnancy

Food Items	Before Intervention	Immediate After Intervention	Follow-up	FET P value
Types of food consumed daily				
Complete correct answer	15	35	32	68.568
Incomplete correct answer	85	5	4	0.000
Don't know	10	0	0	0.000
Foods avoided during pregnancy				
Complete correct answer	20	31	26	37.886
Incomplete correct answer	55	5	10	0.000
Don't know	15	0	0	0.000
Amount of food consumed during pregnancy				
Complete correct answer	18	30	28	47.534
Incomplete correct answer	57	6	8	0.000
Don't know	25	0	0	0.000
Meal preferences during pregnancy				
Complete correct answer	15	29	23	37.868
Incomplete correct answer	27	7	13	0.000
Don't know	4	0	0	0.000
Importance of a balanced diet during pregnancy				
Complete correct answer	14	25	20	42.865
Incomplete correct answer	19	11	16	0.000
Don't know	13	0	0	0.000
Sources of advice for feeding during pregnancy				
Complete correct answer	13	28	25	42.724
Incomplete correct answer	31	8	11	0.000
Don't know	2	0	0	0.000
Experience of tiredness or upset stomach				
Complete correct answer	15	29	23	37.868
Incomplete correct answer	27	7	13	0.000
Don't know	4	0	0	0.000

The table-3 presents the distribution of studied women according to their knowledge of various food items during different phases of the study. It illustrates the percentage of participants providing complete, correct, incomplete, and correct answers and those who indicated they didn't know about each food item before, immediately after, and during the follow-up. Statistical analysis using

Fisher's Exact Test (FET) was conducted to determine the significance of changes in knowledge levels across different study phases. The results show significant improvements in knowledge about food items during pregnancy following the intervention, as evidenced by the shift towards higher percentages of complete, correct answers and lower percentages of incomplete correct answers and "don't know" responses.

DISCUSSION

This study investigated pregnant women's demographic characteristics, dietary patterns, and knowledge levels about nutrition during pregnancy**.** The majority of participants, 70.0% of the sample, are in the 20- to 30-year-old range. Educational attainment varies, with the highest percentage of participants having completed a diploma (40.0%), followed by university education (35.0%). Regarding job status, more participants are identified as housewives (60.0%) compared to employees (40.0%). The predominance of participants aged 20 to 30 years suggests that this demographic group constitutes a significant portion of the pregnant population under study. This demographic trend aligns with global trends, as women within this age range often represent the peak reproductive years[11]. Additionally, the diverse educational backgrounds of the participants, with a notable proportion having completed a diploma or university education, highlight the importance of tailoring nutritional education programs to accommodate varying levels of educational attainment. Moreover, the higher prevalence of homemakers among the participants emphasizes the need for accessible and targeted nutritional guidance for this group, who may have more opportunities to engage in meal planning and preparation. It is the same noticed by Hu J et al., 2019 in their studies[12]. The frequency distribution of participants' dietary habits during pregnancy reveals varying levels of consumption of different food items, such as red meat, chicken, fish, fruits and vegetables, milk, sweets, and fast food. Notably, a significant proportion of participants reported consuming red meat, chicken, and milk daily, while a considerable percentage indicated consuming fruits and vegetables rarely per week. Furthermore, a substantial portion of participants reported consuming fast food during pregnancy, with a majority consuming it at least once a week. The frequency distribution of dietary habits among pregnant women revealed positive and concerning trends. While a considerable proportion reported consuming red meat, chicken, and milk daily, indicating adequate protein and calcium intake, a significant percentage reported rarely consuming fruits and vegetables Lee S *et al.,* 2012[13]. This highlights a potential gap in dietary diversity and micronutrient intake, which is essential for supporting maternal and fetal health during pregnancy. Additionally, the high prevalence of fast-food consumption among pregnant women is concerning, as it may contribute to excessive weight gain and nutrient deficiencies, thereby increasing the risk of adverse pregnancy outcomes. The distribution of participants' knowledge about various food items during different study phases showed improvements following the intervention. Significant shifts were observed in the percentages of participants providing complete, correct answers, incomplete correct answers, and "don't know" responses before the intervention, immediately after the intervention, and during the follow-up. Statistical analysis using Fisher's Exact Test (FET) confirmed the significance of these changes, indicating a notable enhancement in knowledge levels about food items during pregnancy post-intervention. The observed improvements in knowledge levels regarding food items during pregnancy following the intervention underscore the effectiveness of targeted nutritional education programs. The significant shifts in the percentages of participants providing complete, correct answers, particularly immediately after the intervention and during the follow-up, indicate the positive impact of the intervention on enhancing participants' understanding of nutritional requirements during pregnancy. These findings highlight the

importance of ongoing education and reinforcement to ensure sustained improvements in dietary practices among pregnant women[14]. Overall, the findings suggest that while pregnant women exhibit varied dietary patterns and levels of knowledge about nutrition during pregnancy, targeted interventions can effectively improve their understanding and nutritional practices. Implementing educational programs tailored to address specific dietary needs and knowledge gaps among pregnant women could lead to better health outcomes for mothers and infants. The findings from the tables provide valuable insights into pregnant women's demographic characteristics, dietary patterns, and knowledge levels, which are crucial aspects to consider in promoting maternal and fetal health. This discussion analyses these findings and their implications for maternal nutrition education and healthcare interventions during pregnancy. The findings from this study have important implications for maternal nutrition education and healthcare interventions during pregnancy. Targeted educational programs should be developed to address specific dietary needs and knowledge gaps among pregnant women, focusing on promoting dietary diversity, micronutrient intake, and healthy eating behaviours. Additionally, healthcare providers should actively engage with pregnant women to provide personalized nutritional counselling and support throughout pregnancy. Furthermore, community-based initiatives promoting healthy eating habits and facilitating access to nutritious foods should be encouraged to create an enabling environment for optimal maternal and fetal health.

CONCLUSION

In conclusion, the findings underscore the importance of addressing demographic, dietary, and knowledge-related factors in promoting maternal nutrition and improving pregnancy outcomes. Healthcare providers and policymakers can play a critical role in ensuring mothers' and infants' well-being during pregnancy and beyond by implementing targeted educational interventions and supporting pregnant women in adopting healthy nutritional practices.

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