SUSTAINABLE NUTRITIONAL FOOD MANAGEMENT FOR MATERNAL AGES AND PREGNANCY OUTCOME PATIENT: A CASE STUDY ON 250 BEDDED MOHAMMAD ALI HOSPITAL, BOGURA DISTRICT

A PROJECT REPORT
BY

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Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment of B.Sc. in Nutrition and Food Engineering

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APPROVAL

This Project titled "**Sustainable Nutritional Food Management for Maternal Ages and Pregnancy Outcome Patient: A Case Study on 250 Bedded Mohammad Ali Hospital, Bogura District**", submitted by **Habiba Akter** to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents.

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DECLARATION

We hereby declare that this project has been done by under the supervision of **Dr. Md. Mahbubur Rahman,** Associate Professor and co-supervised by **Md Harun-Ar-Rashid,** Assistant Professor, Department of Nutrition and Food Engineering, Daffodil International University. We also affirm that neither this thesis report nor any part of this project report has been submitted elsewhere for any degree or diploma award.

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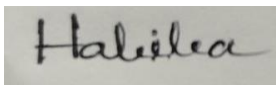

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ABSTRACT

Study focused on sustainable nutritional food management for maternal ages and pregnancy outcome patient in tertiary level hospital of Bangladesh like 250 Bedded Mohammad Ali Hospital, Bogura District. Malnutrition's impact Maternal pre-pregnancy overweight and obesity are well-established predictors of fetal growth, raising the risk of adverse birth outcomes such as low birth weight. The study followed cross-sectional process on food management questionnaire (FMQ) was distributed to collect information on food frequency, gender, BMI and living arrangements of hospital patient. Patient aware nutritional food specific to age during pregnancy are associated with age 99% ($p \geq 0.05$) of maternal hospital patient and Body Mass Index (BMI) standard correlation. Hospital provides guidance on patient diet based on the maternal age correlated on maternal ages group ($p \geq 0.05$). The factors challenge in adapting diet to accommodate age-related nutritional needs during pregnancy strongly correlated with women ages ($p \geq 0.05$) their nutritional food management. Also, study findings that pregnancy outcome patient per day intake food eats 2-3 times in breakfast their ages 21-25, fresh food consumption maximum 35 women patient and their 18-20 maternal ages. Cooked green vegetables daily consumption women are 59 their ages group 21-25 and pregnancy outcome women per day eat vegetables' leaf minimal 2 women their ages 36-40 plus .It is imperative that hospital and household area concerned to enhance the implementation of antenatal care recommendations to promote a healthy pregnancy, guarantee a varied diet for pregnant women, and augment women's knowledge by furnishing them with precise information and assisting them in surmounting barriers impeding their advancement towards improved health.

Keyword: Sustainable Nutritional Food Management, Maternal Health, Pregnancy Outcomes, Body Mass Index (BMI), Antenatal Care Recommendations (ACR)

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CHAPTER 1

INTRODUCTION

1.1 Background

Women in industrialized nations are increasingly delaying childbirth. From 1974 to 2001, the average maternal age, which her first child was born in Bangladesh rose from 9 to 15, declining to 20 to 28 years (Miele et al., 2021). Pregnancy complications that are extreme and adverse, including stillbirth, premature neonatal mortality, and low birth weight, have a significant impact on public health (Ramakrishnan et al., 2012). Nutrition is the foundation upon which a nation's social and economic progress is built. It is an important part of the nutritional food pattern in Bangladesh is completely dedicated to putting both of these into action. If people had better diet, their immune systems would be stronger, leading to fewer illnesses, improved health and a more pregnancy outcome patient (Jahromi & Husseini, 2008). Given the importance of preconception and prenatal nutrition to the females especially to those whose age ranging from 15 to 49 years, considered as maternal and pregnancy outcome women (Khadivzadeh,2002), are a particular focus of attention. Inadequate nutrition during the preconception period can elevate the likelihood of unfavorable consequences for the unborn child and have a detrimental impact on the development and function of the placenta (Pinheiro et al., 2019). This study focusses on the factors that are dietary pattern impact on maternal ages and pregnancy outcome patient in Bogura district of Bangladesh. In impoverished countries, a lack of nutritional diversity is a problem that disproportionately affects the health of children and women (Kenny et al., 2013). Nutrition status in Bangladesh typically consist mostly of starchy carbohydrates, with very little or no consumption of animal products and very low consumption of fresh fruits and vegetables. This results in a very low dietary diversity index, which measures contribution of the types of food different from wheat and starch roots (Workicho et al., 2020). Studies demonstrated that dietary diversity has a favorable association with overall dietary quality, as well as the intake of micronutrients by early maternal ages pregnancy outcome women in Bangladesh (Nelson et al., 2010). It has also been linked to healthier nutritional status in reproductive women when there is a greater diversity of foods consumed. The consumption of different fruits, vegetables and other foods derived from plants is associated with reduced rates of illness and mortality (Mitchell et al., 2004). On the other side, an alarmingly high percentage of maternal ages women in the Bogura district, Bangladesh is malnourished. It is defined as the inability to ingest enough calories, protein, and micronutrients to meet the fundamental needs of the body during the maternal age’s years for basic functions such as maintenance, maturation, and growth (DiGravio et al., 2019).

1.2 Objectives

The evaluate the dietary intakes and dietary patterns among maternal ages pregnancy outcome patient in Bogura district of Bangladesh, so that a comparison can be made between the levels of nutrition in the selected areas. The following activities has brought about the desired results:

- To determine maternal age demographics in Bogura district, Bangladesh.
- To evaluate diet's effect on older women's pregnancies and nutrition.
- To analyzing nutritional status of pregnant women at Mohammad Ali Hospital, Bogura.
- To measure BMI of pregnant women to assess food needs.

CHAPTER 2

LITERATURE REVIEW

This chapter will undertake a literature review on dietary habits and relationship practices among attending pregnant women in Bangladesh, with an emphasis on nutritional habits. Academics specializing in food and health and authors and columnists who write on these subjects have authored books, papers, and articles concerning sustainable nutritional food management for patients' pregnancy outcomes and maternal ages in the Bogura district of Bangladesh. It is vital to emphasize that a lack of understanding regarding the necessity of a diverse and balanced diet or nutritional food selections may be at fault. A study indicated that women were more likely to get enough amounts of key micronutrients if they took foods from at least five of ten recommended food-groups (Marvin-Dowle et al., 2018). Encourage the consumption of these micronutrient-rich foods to protect women's health and prevent micronutrient deficiencies (Bhutta et al., 2013).

Table 1: Comparisons on ages wise food consumption (N = 2653) (Adinma et al. (2017).

Age group	% women who consuming each food group in the last 24 hours							
	DGLV	Vit A F&V	Other F&V	Organ meat	Meat/fish	Eggs	Legumes, nut, seed	Milk, milk products
15-19	42.93	16.30	96.20	0.00	71.20	30.43	28.80	20.11
20-29	45.20	11.12	98.85	0.48	69.24	28.88	33.35	27.55
30-39	46.14	12.04	98.65	0.27	67.93	26.93	32.61	29.50
40-49	48.00	9.33	98.67	0.00	64.00	26.67	30.67	32.00
p-value	0.838	0.186	0.037*	0.637	0.635	0.691	0.631	0.066

Table 1 presents the correlations that have been found between the intake of each of nine dietary groups that are utilized in calculation of women dietary diversity (Adinma et al., 2017) and the demographic features of the women and In comparison with women who did not consume these items, those who did consume dark and green leafy vegetables (DGLV), eggs, and other animal-sourced foods (ASFs), notably fish had a lower risk of anemia and a lower risk of being underweight, respectively.

It was reported that one hundred percent of the women had consumed starchy staples, forty- five percent had consumed DGLV, twelve percent had consumed fruits and vegetables rich in vitamin A, ninety-eight percent had consumed other fruits and vegetables, less than one percent had consumed organ meat, 69% had consumed meat and fish (Harris- Fry et al., 2015). Mean WDD scores were greatest for women in

Dhaka, then Barisal, and finally Khulna (p0.05). There were statistically significant differences in WDD by women's education, household head's education, and wealth quintile (p0.01). Women's DGLV consumption varied greatly by location, with the highest rates seen in Dhaka (Mirmiran et al., 2006), then Barisal, and finally Khulna (p0.01). Women in households headed by males ate more vitamin A-rich vegetables and fruits than those headed by women (p0.01). There was a statistically significant (p0.05) difference in other fruit and vegetable consumption between age groups.

Women of childbearing age had their nutritional condition determined by body mass index and were classified as either thin, normal, or overweight. The prevalence rates for underweight, normal as well as overweight women were determined to be 23.5, 60.2, and 16.3%, respectively. Women living in poverty were nearly five times more likely to be underweight 38.8% than women living in affluence 8.3% (Englund-Ögge et al., 2019). Thinness was more common in rural places, whereas obesity was more common in rural areas (Lartey, 2008). The prevalence of healthy body mass index (BMI) did not, however, vary significantly across urban and rural regions or between the wealthiest and poorest quintiles.

Women employed multiple strategies to make ends meet. The strategies were supported by women's heightened consciousness regarding their financial constraints and the potential manipulation of their food supply to prevent hunger for themselves and their families (Miele et al., 2021). Women exhibited impressive financial management skills, carefully planning their food consumption based on household patterns and purchasing only the essentials. Their comprehensive understanding of food prices allowed them to plan meals and make purchases within a stringent budget. According to Thangaratinam et al. (2012) findings are certain women increased their income by selling household items or obtaining additional mortgage payments; however, one woman claimed to have no unnecessary items to sell. The women accepted the inevitability of this approach and maintained a pragmatic stance.

Numerous determinants impacting the participants' dietary preferences were discerned. The desire for a healthy infant facilitated healthy food selection, whereas obstacles included exorbitant food costs and physical limitations arising from pregnancy symptoms (Miele et al., 2021). Women desired to improve their diet to promote their child's growth and development. Most women reported increasing their breakfast consumption and meal frequency, and all reported taking pregnancy supplements, which were universally regarded as costly but essential. The cost of maintaining a healthy diet during pregnancy impacted the food preferences of most women, diminishing their emphasis on nutritional sufficiency. Regarding the dietary behaviors and perceptions of weight management among overweight and obese women during pregnancy, three major themes emerged (Kaiser & Allen, 2002): "the influence of pregnancy on dietary behaviors," "external influences on dietary behaviors," and "perception of weight-related advice and resources and preferences" The initial two themes collectively depict the dietary experiences of pregnant women and how pregnancy-related and external factors impact their dietary choices (Ramakrishnan et al., 2012).

Mirghani and Hamud (2006) articulated on women's food preferences and dietary behaviors were influenced by pregnancy and its symptoms as they attempted to "balance the good with the bad." Pregnancy and the "physiological changes" accompanying it impacted certain individuals' food preferences, while others regarded it as a "justification" to indulge. The concluding subtheme of responsibility' emphasized that while bodily changes and cravings can impact a pregnant woman's dietary habits, she ultimately bears the responsibility for her dietary selections, as well as the health of her unborn child.

CHAPTER 3

MATERIALS AND METHODS

3.1 Methodology

We used a mostly analytical methodology to explain how pregnant women are currently viewed in society. In analyzing the study question, it also adopts a socio-legal perspective.

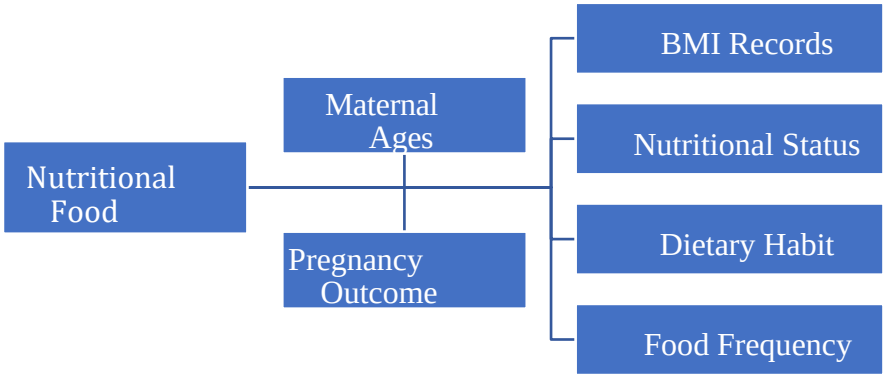

Figure 1: Conceptual framework of the study.

Figure 1. Food habits and maternal ages women age factor is described as ill health due to deficits of protein, calories, vitamins, and minerals interacting with infections and other poor health and social situations.

3.2 Study Design

Women in the study were female patient of the 200 bedded Mohammad Ali Hospital, Bogura District who were between the maternal ages of 15-49 and pregnancy outcome women. This type of study will be descriptive and cross-sectional at the same time.

3.2.1 Study Period

The study was conducted from 4th January to 31 may 2024.

3.2.2 Study Area

Mohammad Ali Hospital was established in 1992 with 200 beds. This hospital the first modern standard super-specialty hospital of the country (DGHS, 2024), dedicated exclusively to the diagnosis and treatment of cardiovascular diseases.

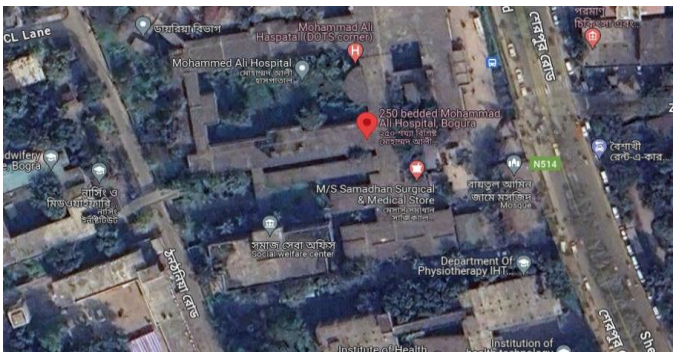

Figure 2: Map of the Study area, Source: Google, (2024).

Area Address

Mohammad Ali Hospital is a hospital in Paurashava, Bogra Sadar Upazila, Rajshahi Division. Mohammad Ali Hospital is situated nearby to the hospital Aloke Nursing Home and oncology Centre and the bus station Thanthania Bus Stand.

Table 2: Study population Statistics, Source: DGHS, (2024)

Description	Hospital Total
Reg. Pregnant Women	4969
At least 1 ANC	4969
ANCs (4+)	1650
Normal Delivery	492
Cesarean Section	1158
Other Assisted Delivery	0
PNC Within 2 days	1650
Maternal Death	1

3.2.3 Sample Determination

Pregnant outcome maternal ages patient that 4969 women in Mohammad Ali Hospital. Random sampling method for determining statistical equations (Dell et al. 2002)

$$n = \frac{z^2 pq}{d^2}$$

$$n = \frac{[(1.96)^2 \times (0.95) \times 0.05]}{(0.0304)^2} = 197.450$$

Confidence level	1.96 (95%)
P value for Z-score	0.95
Proportion	1.0-0.95 =0.05
Degree of Accuracy	0.04

Total Sample size= 192

3.2.4 Sample Approach

The surveying portion started in February 2024. The questionnaire is ages group-wise distributed on 197 women to the various maternal patient of 250 Bedded Mohammad Ali Hospital in Bogura District, Bangladesh.

3.3 Data Collection Method

Data will be collected from primary and secondary sources (books, article, newspaper). Quantitatively, the survey has carried out using an oral questionnaire (M. S. Hosen, 2022). The questionnaires were distributed to all parents after obtaining their consent and explaining the purpose of the study. Secondary sources of data have been collected from books, articles, newspapers, and government reports of Bangladesh.

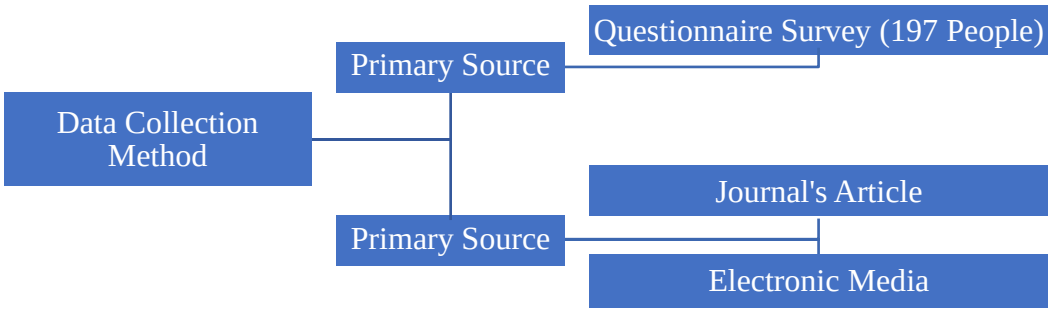

Figure 3: Data collection method

3.4 Data Analysis Tools and Technique

I have been data entries by Microsoft Excel 2019 software and coding in statistical package for social sciences (SPSS) analysis tools (M. Hosen et al., 2024) . Women of all ages were included in the descriptive data analysis and correlation studies helped pinpoint variables linked to women's nutritional status.

3.5 Measure

3.5.1 Inclusion Criteria

- All demographic characteristic and food habit data collection from 18-40+ women of tertiary level hospital in Bangladesh.
- Pregnancy women who consented willingly were included in the study.

3.5.2 Exclusion Criteria

- I excluded male respondent from tertiary level hospital like 250 Bedded Mohammad Ali Hospital in Bogura district of Bangladesh.

3.6 Ethical Consideration

All responses were kept confidential. Moreover, the Data Protection Act of 2009 and the Digital Security Act of 2018 were followed to guarantee the data's security.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Descriptive statistics

Table 3: Descriptive statistics of variable

Variable	Mean	Std. EM	Std. Dev
Women ages' group distribution	1.94	0.069	0.965
Respondent educational qualification	2.53	0.108	1.510
Religion	1.48	0.062	0.866
Profession by family income sources	3.11	0.122	1.712
Monthly average family income	2.22	0.069	0.969
Patient aware nutritional food in specific during pregnancy	1.33	0.034	0.482
Hospital provides food guidance on maternal ages' patient	1.64	0.035	0.492
Patient feel confident in managing food intake in pregnancy outcome	1.54	0.036	0.510
Challenges in adapting diet to accommodate nutritional needs	1.36	0.034	0.481
Patient regularly consulting with healthcare professionals to ensured food	1.42	0.035	0.495
Women specific dietary recommendations to maternal age	1.38	0.035	0.487
Patient making dietary choices that during pregnancy	1.38	0.035	0.486
Women noticed any differences in dietary needs during pregnancy	1.54	0.036	0.499
Cultural factors that influence women food management practices	1.53	0.036	0.500
Dietary supplements doctor recommended for	1.52	0.036	0.501

pregnancy outcome patient			
Women changes in appetite or cravings during pregnancy related to age	1.48	0.036	0.501
Patient concerns about managing food intake during pregnancy	1.53	0.036	0.500
Maternal patient has impacted ability to manage on food intake effectively	1.53	0.036	0.500
Information or resources optimized on food management during pregnancy outcome	1.62	0.035	0.487
Adjustments to patient lifestyle or diet to support pregnancy based on women age	1.63	0.034	0.484
Difficulties in accessing nutritious food options that meet age-specific needs during pregnancy outcome	1.67	0.034	0.471
Nutritional advice patient receives from healthcare providers based on women age	1.68	0.034	0.478
Misconceptions or myths about dietary management during pregnancy at women age	1.74	0.062	0.870
Food Frequency (average)	3.78	0.055	0.764

Table 3 indicate that were 197 respondents who gave their age in this survey, the (18-40+) years women patient of survey hospital, Bogura district part of Bangladesh. The maximum mean found that 3.78 of food frequency their standard deviation is 0.764 it's standard error of means 0.055 has been significance for the study. Minimum mean found of patient aware nutritional food in specific during pregnancy are 1.33 their standard deviation is 0.0482 and standard error of means 0.034 has been found table 3. Significantly standard deviation maximum found that family income sources is 1.712 their standard error of means is 0.122 and minimum standard deviation on challenges in adapting diet to accommodate nutritional needs is 0.481 its standard error of means 0.034 associated. Total standard error of means women ages group is 0.069 maximum found their standard deviation 0.965 has been found on all dataset.

4.2 Demographic Characteristic of Women Patient

A hospital patient (only women) demographic is easily discernible. To mention a few, these characteristics include things like one's age, gender, family situation, education, earnings, and race.

Table 4: Women age group distribution

Category	Frequency	Percent
Age (18-20)	73	37.06
Age (21-25)	83	42.13
Age (26-30)	23	11.68
Age (31-35)	15	7.61
Age (36-40)	3	1.52
Total	197	100.00

According to table 4 it was found that just (37.06%) of the respondents are 18-20 ages, 21-25 ages group are (42.13%), 26-30 ages group women (11.68%), 31-35 ages group patient (7.61%), 36-40 years older ages (1.52%) women patient has been found filed survey 2024.

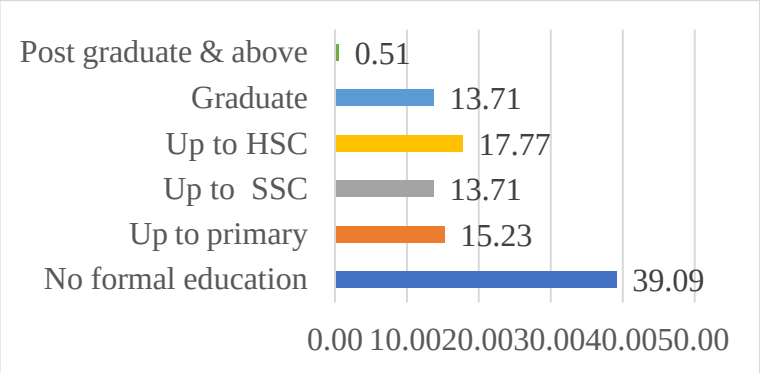

Figure 4: Respondent educational qualification

Figure 4 disclose that (39.09%) are no obtained formal education has found, (15.23%) patient is completed primary education, (13.71%) maternal ages patients are SSC passed, (17.77%) women obtained HSC degree, (13.71%) of graduation completed and (1%) women patient complete higher education in 250 Bedded Mohammad Ali Hospital in surveyed respectively (N=197).

Table 5: Religion by respondent

Category	Frequency	Percent
Muslim	139	70.56
Hindu	35	17.77
Buddhist	10	5.08
Christian	13	6.60
Total	197	100.00

Table 5 data expose that majority (70.56%) are believed Islam religion, (17.77%) of patient are Hinduism believer, (5.08%) women their believed in Buddhist and only (6.60%) women believed on Christianity religion in surveyed respectively.

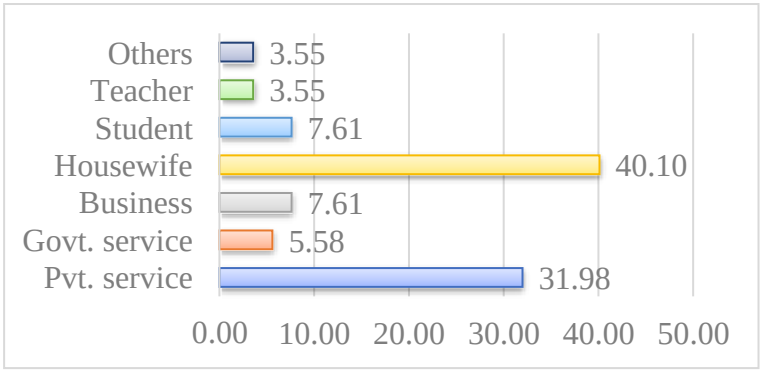

Figure 5: Profession by family income sources.

Most of the respondent (40.10%) family income sources or their professional distinctiveness on housewife, (31.98%) are profession of private service, business profession is (7.61%), and (7.61%) students, (3.55%) teacher and other profession has belonged women in shown figure 5

Table 6: Monthly average family income

Category	Frequency	Percent
≤ 15,000 Taka	44	22.34
15,001-20,000 Taka	93	47.21
20,001-30,000 Taka	35	17.77
30,001-40,000 Taka	22	11.17
40,001-50,000 Taka	3	1.52
Total	197	100.00

Table 6 shows that (22.34%) women patient family income range below 15000-taka, maximum family income (47.21%) is 15001–20000-taka ranges, (17.77%) family income is 20001–30000-taka ranges, (11.17%) women patients are family income within 30001-40000 taka and only (1.52%) patient there are family income up to 40001-500000 taka in average monthly.

4.3 Nutritional Food Management for Maternal Ages and Pregnancy Outcome Patient

Pregnant women are advised to take a daily vitamin and mineral supplement to ensure adequate intake of iron and folic acid as well as to follow a diet high in fruits, vegetables, and whole grains. A necessary physiological change that occurs during pregnancy is maternal weight gain.

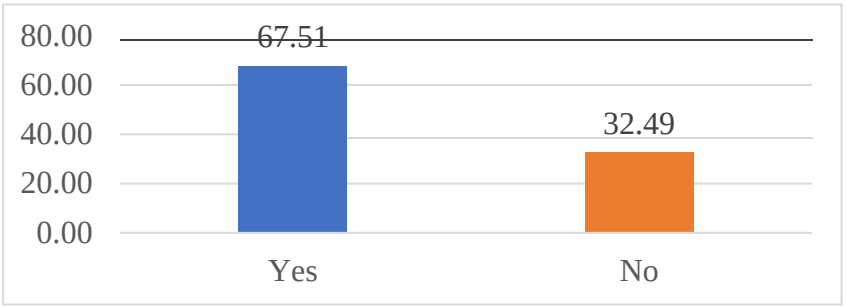

Figure 6: Patient aware nutritional food specific to age during pregnancy

Figure 6 shows that Patient aware nutritional food specific to age during pregnancy are (67.51%) and maternal ages women patient (32.49%) not aware on nutritional food in field survey respectively (N=197).

Table 7: Hospital provides guidance on patient diet based on the maternal age

Category	Frequency	Percent
Yes	72	36.55
No	125	63.45
Total	197	100.00

Table 7 exposes that hospital provides guidance on patient diet based on the maternal age is (36.55%) and not guided dietary chart (63.45%) in the hospital at the found 250 Bedded Mohammad Ali Hospital, Bogura District patient.

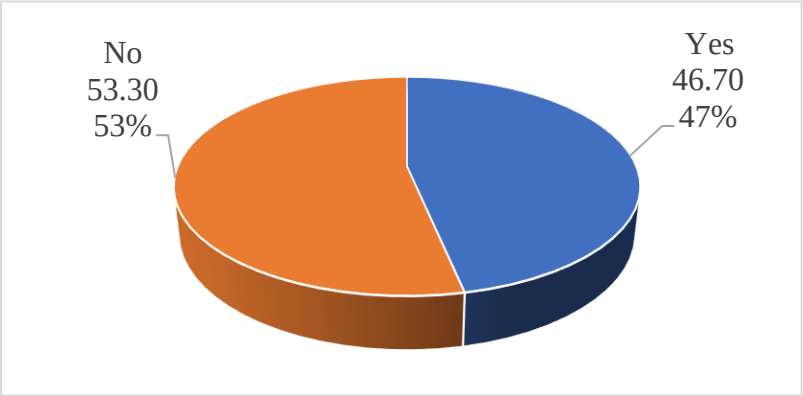

Figure 7: Patient feel confident in managing food intake to meet the needs inpregnancy time

Figure 7 shows that (53.30%) are patient feel confident in managing food intake to meet the needs in pregnancy time and only (46.70%) patient is managed food intake in found field survey respectively (N=197).

Table 8: Challenges in adapting diet to accommodate age-related nutritional needs during pregnancy

Category	Frequency	Percent
Yes	126	63.96
No	71	36.04
Total	197	100.00

Table 8 reveal that challenges in adapting diet to accommodate age-related nutritional needs during pregnancy is (63.96%) and not accommodated (36.04%) nutritional needs during their pregnancy the found field survey respectively.

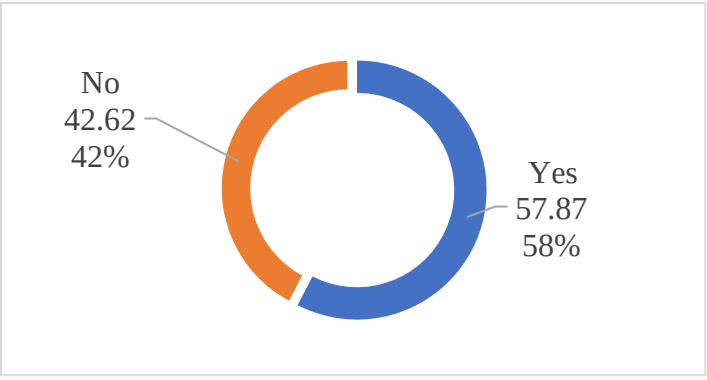

Figure 8: Patient regularly consulting with healthcare professionals to ensure food management aligns with maternal age

Figure 8 shows that patient regularly consulting with healthcare professionals to ensure food management aligns with maternal age are (57.87%) by the specialist and (42.62%) women patient not regular consulting at the maternal ages time (N=197).

Table 9: Women specific dietary recommendations tailored to age during pregnancy

Category	Frequency	Percent
Yes	122	61.93
No	75	38.07
Total	197	100.00

Table 9 data exposes that woman specific dietary recommendations tailored to age during pregnancy is (61.93%) and only (38.07%) are not recommended dietary the found field survey respectively.

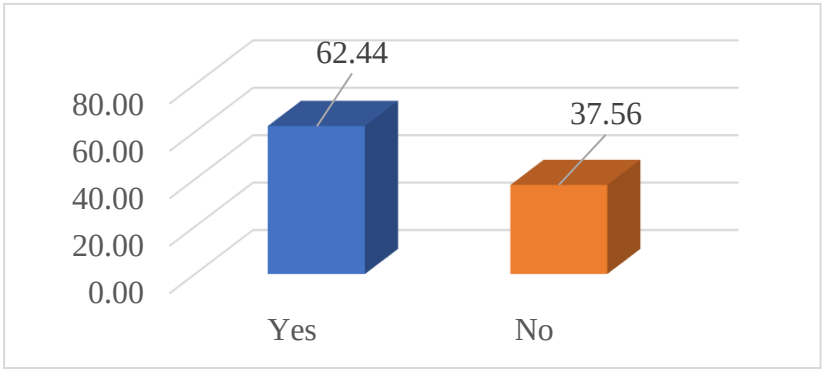

Figure 9: Patient making dietary choices that address age-related nutritionalrequirements during pregnancy

Figure 9 shows that patient making dietary choices that address age-related nutritional requirements during pregnancy are (62.44%) women and (37.56%) patient not patient making dietary found that field survey respectively (N=197).

Table 10: Women noticed any differences in dietary needs during pregnancy compared to women of different ages

Category	Frequency	Percent
Yes	90	45.69
No	107	54.31
Total	197	100.00

Table 10 data reveal that women noticed any differences in dietary needs during pregnancy compared to women of different ages is (45.69%) and majority (54.31%) are noticed not dietary needs during pregnancy time the found field survey respectively.

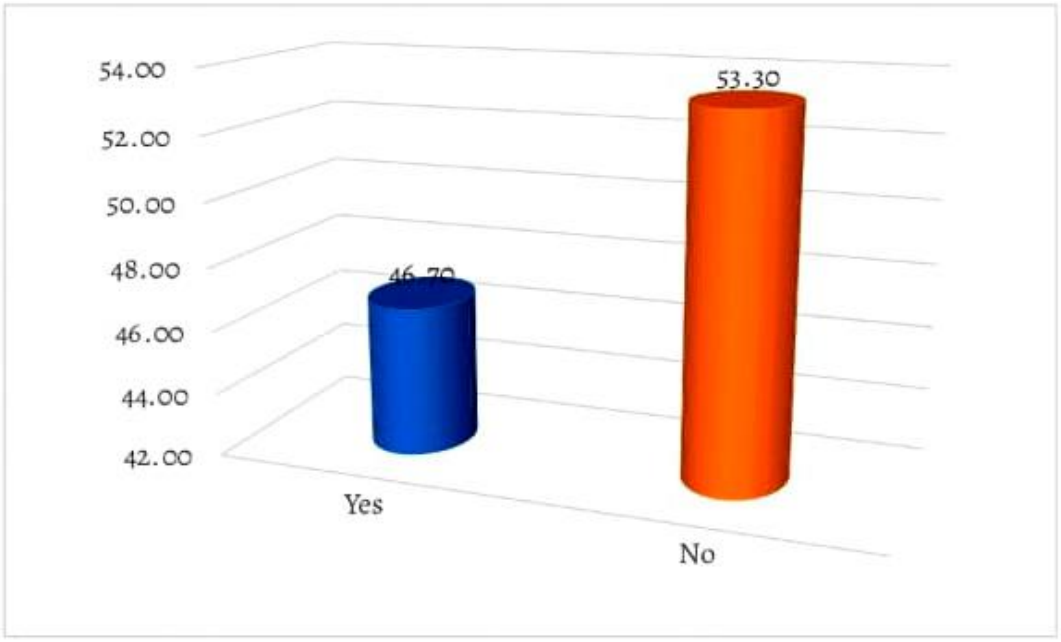

Figure 10: Cultural factors that influence women food management practices during pregnancy at age

Figure 10 cylindric column shows that cultural factors that influence women food management practices during pregnancy at age are (46.70%) and majority (53.30%) patient think not cultural factor food management that field survey respectively (N=197).

Table 11: Dietary supplements doctor recommended for pregnancy outcome at patientage

Category	Frequency	Percent
Yes	95	48.22
No	102	51.78
Total	197	100.00

Table 11 data expose that dietary supplement doctor recommended for pregnancy outcome at patient age is (48.22%) and majority (51.78%) are not supplement suggested by doctors, according to field survey respectively.

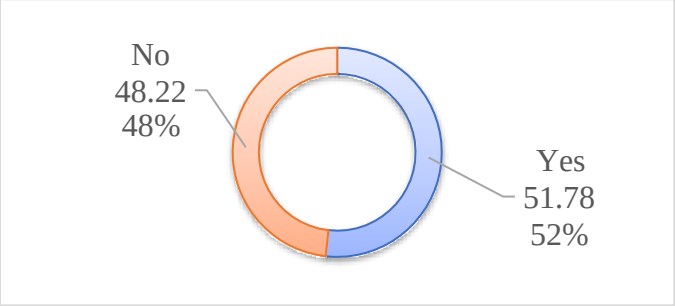

Figure 11: Women changes in appetite or cravings during pregnancy related to age

Figure 11 donut chart shows that women change in appetite or cravings during pregnancy related to age are (51.78%) and minority women patient (48.22%) think there no have appetite or cravings during pregnancy that field survey respectively (N=197).

Table 12: Patient concerns about managing your food intake during pregnancy with your healthcare provider

Category	Frequency	Percent
Yes	93	47.21
No	104	52.79
Total	197	100.00

Table 12 data reveals that patient concerns about managing your food intake during pregnancy with your healthcare provider is (47.21%) and majority (52.79%) are not properly dietary food management in the hospital, according to field survey respectively.

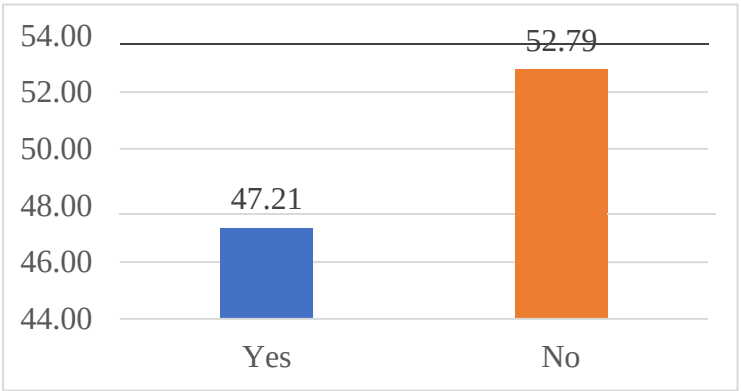

Figure 12: Patient age has impacted ability to manage on food intake effectively during pregnancy

Figure 12 column graph shows that patient age has impacted ability to manage on food intake effectively during pregnancy are (47.21%) and (52.79%) women patient thinks there no impact food management it's found survey respectively (N=197).

Table 13: Information or resources optimized on food management practices during pregnancy outcome

Category	Frequency	Percent
Yes	75	38.07
No	122	61.93
Total	197	100.00

Table 13 data reveals that information or resources optimized on food management practices during pregnancy outcome is (38.07%) and majority (61.93%) are not or resources optimized on food management practices in the hospital, according to field survey respectively.

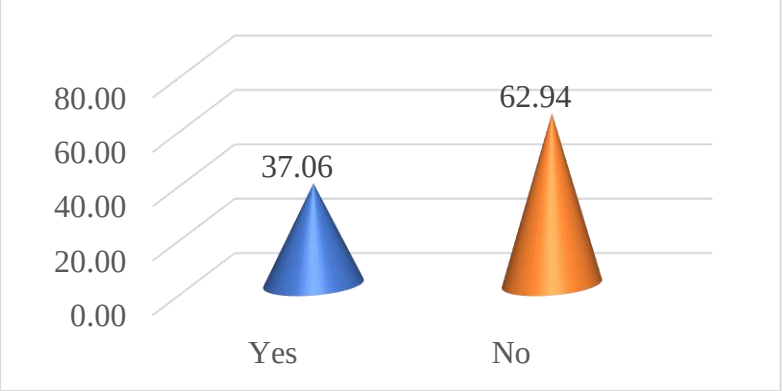

Figure 13: Adjustments to patient lifestyle or diet to support pregnancy based onwomen age

Figure 13 shows that adjustments to patient lifestyle or diet to support pregnancy based on women age are (37.06%) and (62.94%) are no adjustments to patient lifestyle it's found survey respectively (N=197).

Table 14: Difficulties in accessing nutritious food options that meet age-specific needsduring pregnancy outcome

Category	Frequency	Percent
Yes	65	32.99
No	132	67.01
Total	197	100.00

Table 14 data reveals that difficulties in accessing nutritious food options that meet age-specific needs during pregnancy outcome is (32.99%) and majority (67.01%) are not accessing nutritious food options in their maternal ages in found that field survey respectively.

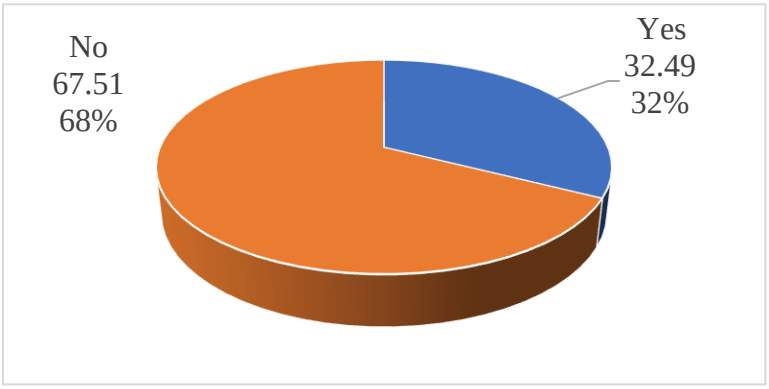

Figure 14: Nutritional advice patient receives from healthcare providers based on women age

Figure 14 pie chart shows that nutritional advice patient receives from healthcare providers based on women age are (32.49%) and (67.51%) are given nutritional in hospital it's found survey respectively (N=197).

Table 15: Misconceptions or myths about dietary management during pregnancy atwomen age

Category	Frequency	Percent
Yes	62	31.47
No	135	68.53
Total	197	100.00

Table 15 data reveals that misconceptions or myths about dietary management during pregnancy at women age are (31.47%) and majority women patient (68.53%) are not believed myth and traditional misconception in found that field survey respectively.

4.4 Food Frequency (Multiple Responses)

Table 16: Food frequency by women ages (N = 197)

Type of Foods/Categories		Women ages' group distribution				
		(18-20)	(21-25)	(26-30)	(31-35)	(36-40+)
Breakfast cereal	6+ times	0	1	0	0	0
	4-5 times	10	1	3	0	1
	2-3 times	30	41	16	12	2
	Once	15	14	2	3	0
	No	18	26	2	0	0
Fresh fruit	6+ times	0	0	0	0	0
	4-5 times	8	11	7	4	1
	2-3 times	35	19	10	8	2
	Once	18	17	4	3	0
	No	12	36	2	0	0
Cooked green vegetables	6+ times	0	0	0	0	0
	4-5 times	4	0	1	2	1
	2-3 times	32	59	14	10	2
	Once	29	18	5	3	0
	No	8	6	3	0	0
Vegetable's leaf	6+ times	0	0	0	0	0
	4-5 times	2	2	1	2	1
	2-3 times	38	60	15	7	2
	Once	29	17	4	6	0
	No	4	4	3	0	0
Potatoes, rice	6+ times	0	0	0	0	0
	4-5 times	2	1	0	0	0
	2-3 times	64	77	22	12	3
	Once	6	3	1	3	0
	No	1	2	0	0	0
Meat	6+ times	0	0	0	0	0
	4-5 times	0	0	0	0	0
	2-3 times	13	16	12	9	3
	Once	35	26	6	5	0
	No	25	41	5	1	0
Poultry	6+ times	0	0	0	0	0
	4-5 times	0	0	0	0	0
	2-3 times	7	8	5	2	0
	Once	15	24	11	4	2
	No	51	51	7	9	1
Fish	6+ times	0	0	0	0	0
	4-5 times	0	1	0	0	0
	2-3 times	14	15	11	3	0
	Once	20	9	5	4	1

	No	39	58	7	8	2
Beans or pulses	6+ times	0	0	0	0	0
	4-5 times	1	1	0	0	0
	2-3 times	53	65	18	14	3
	Once	11	9	4	1	0
	No	8	8	1	0	0
Sweets, chocolates	6+ times	0	0	0	0	0
	4-5 times	1	0	4	0	0
	2-3 times	23	15	9	8	1
	Once	25	27	9	6	2
	No	24	41	1	1	0
Local fruit	6+ times	0	3	0	1	1
	4-5 times	11	10	5	3	0
	2-3 times	33	23	13	7	2
	Once	23	39	4	4	0
	No	6	8	1	0	0
Carbohydrate drinks	6+ times	0	0	0	0	0
	4-5 times	0	0	0	0	0
	2-3 times	1	3	0	0	0
	Once	18	7	11	6	3
	No	54	73	12	9	0
Cakes, biscuits, Sweet	6+ times	1	3	0	1	0
	4-5 times	0	4	0	0	2
	2-3 times	33	18	10	6	0
	Once	13	16	8	8	1
	No	26	42	5	0	0

Multiple responses categorical Table 16 reveal that pregnancy outcome patient per day intake food eat 2-3 times in breakfast their ages 21-25, fresh food consumption maximum 35 women patient and their 18-20 maternal ages. Cooked green vegetables daily consumption women are 59 their ages group 21-25 and pregnancy outcome women per day eat vegetables' leaf minimal 2 women their ages 36-40+. Potatoes with rice eat 64 women in 2-3 times and their ages group 18-20. Maximum meat eats 35 pregnancy outcome and lower meat eat 36-40+ ages women group. Poultry consumed women 21-25 ages group eat per day portion. Significantly fish consumed maternal 21-25 ages group in 2-3 times of daily routine. Also, Table 16 Beans or pulses intake minimal 40-40+ ages women and sweets sugar food consumption women are 18-20

ages group in 2-3 times of per day. Local fruit, carbohydrate drinks maternal ages women risky consumed their ages 18-20 group. Cakes, biscuits and sweet item intake 18-35 ages pregnancy outcome women and their feel malnutrition at the maternal ages.

4.5 Pearson Correlation

Table 17: Dependent variable women age, BMI index associated with lifestyle anddietary habits factors (N=197)

Variable		Ages group	BMI
Patient aware nutritional food specific to age during pregnancy	Corr.	-.366**	-.150*
	Sig.	**0.000**	**0.036**
Hospital provides guidance on patient diet based on the maternal age	Corr.	-.354**	-0.058
	Sig.	**0.000**	0.422
Challenges in adapting diet to accommodate your age-related nutritional needs during pregnancy	Corr.	-.352**	-0.035
	Sig.	**0.000**	0.630
Women specific dietary recommendations tailored to age during pregnancy	Corr.	-.313**	-.212**
	Sig.	**0.000**	**0.003**
Patient making dietary choices that address age-related nutritional requirements during pregnancy	Corr.	-.304**	-0.059
	Sig.	**0.000**	0.414
Women noticed in dietary needs during pregnancy compared to women of different ages	Corr.	-.329**	0.105
	Sig.	**0.000**	0.143
Cultural factors that influence women food management practices during pregnancy at age	Corr.	-.287**	0.043
	Sig.	**0.000**	0.547
Dietary supplements doctor recommended for pregnancy outcome at patient age	Corr.	-.257**	-.186**
	Sig.	**0.000**	**0.009**
Information or resources optimized on food management practices during pregnancy outcome	Corr.	-.458**	-0.011
	Sig.	**0.000**	0.878

Difficulties in accessing nutritious food options that meet age-specific needs during pregnancy outcome	Corr.	-.411**	0.005
	Sig.	**0.000**	0.942
Nutritional advice patient receives from healthcare providers based on women age	Corr.	-.404**	-0.013
	Sig.	**0.000**	0.851

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 17 reveal that Pearson correlation strongly significance found that patient aware nutritional food specific to age during pregnancy are associated with age 99% ($p \geq 0.05$) of maternal hospital patient and Body Mass Index (BMI) standard correlation found of the same independent variable. Hospital provides guidance on patient diet based on the maternal age correlated on maternal ages group ($p \geq 0.05$). The factors challenge in adapting diet to accommodate your age-related nutritional needs during pregnancy strongly correlated with women ages ($p \geq 0.05$) their nutritional food management.

Table 17 also reveal that the independent variable are women specific dietary recommendations tailored to age during pregnancy strongly associated with women ages group ($p \geq 0.05$) their nutritional food intake and another dependent variable BMI standardly correlated value is 0.003. Patient making dietary choices that address age-related nutritional requirements during pregnancy strongly associated with maternal ages group ($p \geq 0.05$). Women noticed in dietary needs during pregnancy compared to women of different ages and cultural factors strongly associated on maternal ages group ($p \geq 0.05$). Food supplement doctor suggestion strongly correlated with maternal ages and BMI ($p \geq 0.05$). Hospital information resources and accessing nutritious food options for pregnancy outcome strongly associated on women ages ($p \geq 0.05$). Nutritional advice patient receives from healthcare providers factor strongly correlated on maternal ages women $p \geq 0.05$) of N = 197.

CHAPTER 5

CONCLUSION

5.1 Conclusion

Sustainable nutritional food management was identified in the present study, with the majority of pregnant women patients having a moderate to low degree of dietary diversity and nearly half of the sample being found to have inadequate adherence to hospital guidelines. Body Mass Index (BMI), which is influenced by age and food frequency, is a valuable metric for early nutritional assessment and could be utilized to aid in the formulation of national food management policies by monitoring the progress of pregnant women who are most susceptible to adverse pregnancy outcomes. The results of the study emphasize the necessity of educating pregnant women about the significance of a well-rounded diet, increased food intake throughout pregnancy, sufficient rest, in-center childbirth, and vitamin supplementation. Moreover, this underscores the need for practical resolutions to address the widespread occurrence of inadequate prenatal care and insufficient nutritional variety among women who experience adverse pregnancy outcomes. It is advised to implement measures targeted at health-system interventions, including the provision of comprehensive education on antenatal care and nutrition. Nevertheless, merely increasing maternal knowledge will not suffice to alter attitudes and behaviors. Additionally, factors such as household income, the educational attainment of the husband, and occupational status significantly influence the behavior and perception of pregnant women. It is necessary to develop effective interventions that can surmount barriers related to behavior, perception, and socioeconomic status. As a result, it is imperative that all sectors of development collaborate to enhance the implementation of antenatal care recommendations to promote a healthy pregnancy, guarantee a varied diet for pregnant women, and augment women's knowledge by furnishing them with precise information and assisting them in surmounting barriers impeding their advancement towards improved health.

5.2 Recommendation

Based on the findings of the present study, following recommendations emerge:

Programs for Comprehensive Nutrition: In order to tackle the prevalent challenges of undernutrition and obesity among pregnant women in developing nations such as Bangladesh, it is imperative to establish all-encompassing nutritional initiatives.

- **Neighborhood Centered Interventions:** To enhance maternal nutrition, devise community-based interventions that incorporate the expertise of local health workers and employ culturally sensitive educational approaches.
- **Methods of Policy Implementation:** Ensure that established policies and programs pertaining to maternal health, including the Bangladesh National Strategy for Maternal Health 2019-2030, are efficiently executed.
- **Examining Programmatic Limitations:** Addressing constraints on both the demand and supply sides such as financial limitations and cultural practices as well as service provider workload and resource allocation will enhance the implementation of maternal nutrition interventions.

- **Evaluating and Monitoring:** Implement comprehensive monitoring and evaluation mechanisms in order to gauge the effectiveness of nutritional interventions in influencing outcomes related to pregnancy and the fetus.
- **Community Health Education:** Increase efforts to educate the public about the significance of maternal nutrition and its influence on pregnancy outcomes through public health education.
- **Investigation and Innovation:** Promote the investigation of novel approaches to sustainable nutritional food management, including the implementation of mobile health technologies.

In the study valuable contribution to the advancement of sustainable strategies aimed at enhancing maternal nutrition and pregnancy outcomes in Bangladesh by concentrating on these specific areas. It is crucial to ensure that one's recommendations are in line with the sustainable development goals in order to effectively contribute to more extensive global objectives.

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APPENDICES

Appendix 1: Survey Questionnaire

Date: D D M M Y Y Y Y

Assalamualikum, I am conducting an experiment to sustainable nutritional food management for maternal ages and pregnancy outcome patient. I am engaging patient, Bogura 250 bed Mohammad Ali District Hospital's pregnancy outcome and maternal ages women dietary food habit pattern and future aspect of sustainable nutritional food management. I am Habiba Akter who is conducting research under Dr. Md Mahbubur Rahman, Associate Professor, Faculty of Health and Life Science, Daffodil International University. The data will be used only for bachelor thesis program. These individual questionnaires will be kept confidential and anonymous.

- **A. General Information**

  a) Name of the patient_____

  b) Address _____

  c) Mobile no _____

- **B. Demographic Characteristic of Maternal Ages Women**

Question	Code: Box by tick (✓) mark
1| Age	☐Age (18-20) ☐Age (21-25) ☐Age (26-30) ☐Age (31-35) ☐Age (36-40) ☐Age (41-45) ☐Age (46-49)
2| You're education	☐ No formal education ☐ Up to primary ☐ Up toSSC ☐Up to HSC ☐ Graduate ☐ Post graduate & above
3| Marital Status	☐ Married ☐ Unmarried
4| Religion	☐ Muslim ☐Hindu ☐Buddhist ☐ Christian
5| Profession	☐ Pvt. service ☐ Govt. service ☐ Business ☐ Housewife ☐Student ☐ Teacher ☐ Others
6| Monthly Family Income	☐ ≤ 15,000 Taka ☐15,001-20,000 Taka ☐ 20,001-30,000 Taka ☐30,001-40,000 Taka ☐40,001-50,000 Taka ☐ ≥ 50,001 Taka

- **C. General Question**

Question	Code: Box by tick(✓) mark
7| Body Mass Index (BMI)	Weight: ____ KGs Height:_____In
8| Are you aware of the nutritional requirements specific to your age during pregnancy?	☐ Yes ☐ No
9| Have you received guidance on how to adjust your diet based on your maternal age?	☐ Yes ☐ No
10| Do you feel confident in managing your food intaketo meet the needs of your pregnancy at your current age?	☐ Yes ☐ No
11| Have you experienced any challenges in adapting your diet to accommodate your age-related nutritional needs during pregnancy?	☐ Yes ☐ No
12| Are you regularly consulting with healthcare Professionals to ensure your food management align with your maternal age?	☐ Yes ☐ No
13| Have you been provided with specific dietary recommendations tailored to your age during Pregnancy?	☐ Yes ☐ No
14| Do you feel supported in making dietary choicesthat address your age-related nutritional requirements during pregnancy?	☐ Yes ☐ No
15| Have you noticed any differences in your dietaryneeds during pregnancy compared to women of different ages?	☐ Yes ☐ No
16| Have you encountered any cultural factors that Influence your food management practices during pregnancy at your age?	☐ Yes ☐ No
17| Are you aware of any specific dietary Supplements recommended for pregnant women at your age?	☐ Yes ☐ No
18| Have you experienced any changes in your appetite or cravings during pregnancy related to your age?	☐ Yes ☐ No

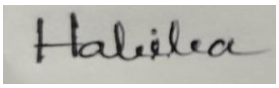
Question	Code: Box by tick (✓) mark
19| Have you discussed any concerns about managing your food intake during pregnancy with your healthcare provider?	☐ Yes ☐ No
20| Do you feel that your age has impacted your ability to manage your food intake effectively during pregnancy?	☐ Yes ☐ No
21| Are you actively seeking information or resources on how to optimize your food management practices during pregnancy at your age?	☐ Yes ☐ No
22| Have you made any adjustments to your lifestyle or diet to support your pregnancy based on your age?	☐ Yes ☐ No
23| Are you experiencing any difficulties in accessing nutritious food options that meet your age-specific needs during pregnancy?	☐ Yes ☐ No
24| Have you noticed any differences in the nutritional advice you receive from healthcare providers based on your age?	☐ Yes ☐ No
25| Have you encountered any misconceptions or myths about dietary management during pregnancy at your age?	☐ Yes ☐ No

26.

Item/Per day	6+ times	4-5 times	2-3 times	Once	No
Breakfast cereal					
Fresh fruit					
Cooked green vegetables					
Vegetable's leaf					
Potatoes, rice					

Meat					
Poultry					
Fish					
Beans or pulses					
Sweets, chocolates					
Local Fruit					
Carbohydrate drinks					
Cakes, biscuits, Sweet					

Thank for co-operation



_____

Habiba Akter
ID: 201-34-267

Department of Nutrition and Food Engineering

Daffodil International University

Appendix 2: External Data (Body Mass Index)

Category	Frequency	Percent
20.4	1	0.51
20.7	1	0.51
21.0	4	2.03
21.5	2	1.02
21.9	3	1.52
22.0	3	1.52
22.2	1	0.51
22.3	4	2.03
23.0	3	1.52
23.4	4	2.03
23.7	1	0.51
23.9	1	0.51
24.1	3	1.52
24.2	3	1.52
24.5	1	0.51
24.6	2	1.02
24.8	2	1.02
25.0	7	3.55
25.1	1	0.51
25.4	5	2.54
25.8	3	1.52
26.0	3	1.52
26.2	8	4.06
26.3	5	2.54
26.6	6	3.05
26.7	1	0.51
26.8	1	0.51
27.0	3	1.52
27.1	6	3.05
27.2	3	1.52
27.3	1	0.51
27.4	2	1.02
27.7	3	1.52
27.8	2	1.02
27.9	2	1.02
28.0	2	1.02
28.2	5	2.54
28.4	3	1.52
28.5	3	1.52
28.6	3	1.52
28.7	4	2.03
29.0	6	3.05
29.1	2	1.02

29.2	1	0.51
29.3	1	0.51
29.4	1	0.51
29.6	3	1.52
29.7	7	3.55
29.8	1	0.51
30.0	2	1.02
30.1	3	1.52
30.2	2	1.02
30.4	3	1.52
30.5	2	1.02
30.8	1	0.51
30.9	2	1.02
31.0	2	1.02
31.2	1	0.51
31.6	1	0.51
31.9	1	0.51
32.0	1	0.51
32.2	2	1.02
32.3	9	4.57
32.5	1	0.51
32.8	1	0.51
33.2	3	1.52
33.5	1	0.51
33.6	2	1.02
34.0	2	1.02
34.4	1	0.51
34.6	1	0.51
34.8	1	0.51
35.8	1	0.51
35.9	1	0.51
37.0	1	0.51
37.1	1	0.51
38.3	1	0.51
38.6	1	0.51
38.7	1	0.51
38.8	1	0.51
40.0	1	0.51
Total	197	100.00

Appendix 3: Survey Photography

Figure 1: Patient in 250 Bedded Mohammad Ali Hospital, Bogura District

Appendix 4: Synopsis

1. **Title:** Dietary Intakes and Dietary Patterns among Maternal Ages Pregnancy Outcome Patient: A Case Study on 250 bedded Mohammad Ali Hospital,Bogura District.

2. Introduction:

Women in industrialized nations are increasingly delaying childbirth. From 1974 to 2001, the average maternal age, which her first child was born in Bangladesh rose from 9 to 15, declining to 20 to 28 years (Miele et al., 2021) . Pregnancy complications that are extreme and adverse, including stillbirth, premature neonatal mortality, and low birth weight, have a significant impact on public health (Ramakrishnan et al., 2012). In the Bogura district of Bangladesh, the nutritional status of women who are of maternal age is often dominated by staple grains from the local bazaar like rice and flour and the intakes of key nutrients such as vitamin A, iron and calcium are inadequate.

- **Background:**

  Given the importance of preconception and prenatal nutrition to the females especially to those whose age ranging from 15 to 49 years, considered as maternal and pregnancy outcome women (Khadivzadeh, 2002), are a particular focus of attention. Inadequate nutrition during the preconception period can elevate the likelihood of unfavorable consequences for the unborn child and have a detrimental impact on the development and function of the placenta (Pinheiro et al., 2019). Dietary food deficiency Anaemic women have a higher risk of premature birth, low birth weight, and neonatal mortality compared to women who are not anemic throughout pregnancy. This study focusses on the factors that are dietary pattern impact on maternal ages and pregnancy outcome patient in Bogura district of Bangladesh.

- **Rationale:**

  It is essential for women to have a nutritional status that is adequate to ensure their own excellent health and an increased capacity for work. The dietary habit pattern impact on maternal ages and pregnancy outcome patient in Bogura district of Bangladesh, such as that of 250 bedded Mohammad Ali Hospital, is an indication of the people's general well-being.

- **Research Question:**

The following research question will serve as the basis for the study:

1. What are the dietary intakes and dietary patterns among maternal ages pregnancy outcome patient of Bogura district?

3. Objectives:

- To determine the demographic characteristic of maternal ages women of Bogura district, Bangladesh.
- To evaluate the dietary habits pattern impact on maternal age's women and pregnancy outcome patient in nutritional status change.
- Analyzing the nutritional intake of pregnancy outcome patient focused on 250 bedded Mohammad Ali Hospital, Bogura District.
- To measure BMI for women of reproductive age its impact on body

4. Methodology:

- **Study Design**

Women in the study were female patient of the 250 bedded Mohammad Ali Hospital, Bogura District who were between the maternal ages of 15-49 and pregnancy outcome women. This type of study will be descriptive and cross-sectional at the same time.

- **Sample Determination**

Purposive sampling method has been proposed.

- **Data Collection Method**

Primary and secondary study related sources data will be collected. Surveys of the study's subjects with the most relevant questionnaires to answering the question unit and achieving the aims set out in the study. I will make English to Bangla transcripts of his/her interviews.

- **Data Analysis Tools and Technique**

I will be data entries by Microsoft Excel 2019 software and coding in SPSS analysis tools. Women of all ages were included in the descriptive data analysis and correlation studies helped pinpoint variables linked to women's nutritional status.

- **Ethical Consideration**

All responses were kept confidential. Moreover, the Data Protection Act of 2009 and the Digital Security Act of 2018 were followed to guarantee the data's security.

5. Expected Outcomes:

Dietary intakes and dietary patterns among maternal ages pregnancy outcome patient the focus of research into age group issue of malnutrition is a Bangladesh concern. The state is bearing the weight of a double nutrition burden due to the high rates of both obesity and chronic undernourishment.

6. Socio-economic Impact:

Findings from this research will show that women's risk of malnutrition can be predicted by factors such as age, family wealth index, marital status, domicile, and level of education.

7. Time Schedule of Activities:

Task	**Activities by Days (20 Fabray to March 30, 2024)**											
	20-28 Feb			1-10 Mar			11-15 Mar			16-29 Mar		30 Mar
Literature research				↔	↔							
Study protocol and questionnaire development												
Data collection and data entry												
Thesis writing												
Data analysis and												
Thesis chapter full drafting												
Thesis Correction and editing											↔	
Printing and binding												↔

8. References: American Psychological Association (APA) 7th Edition

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Signature of Co-supervisor

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Mr. Md. Harun-Ar-Rashid
Assistant Professor
Department of Nutrition and Food Engineering

Appendix 5: Plagiarism Report

ORIGINALITY REPORT

6%	5%	2%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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17	Wolstein, Joelle. "Examining Obesogenic Behavior Through the Lens of the Food Environment.", Proquest, 2015. Publication	<1%