

## Nutritional Status and Morbidity Patterns among Non-Pregnant Non-Lactating Rural Women of Reproductive Age Group (18-40) at Dumki Upazila of Patuakhali District

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**Abstract:** Diet and nutrition are important factors for maintenance of good health throughout the life cycle. There are many factors viz; income, prices, individual preferences and beliefs, cultural traditions, as well as geographical, environmental, social and economic factors all interact in a complex manner to shape dietary consumption patterns and that affect the morbidity and nutritional status of women. The study assesses the nutritional status and morbidity patterns among 100 non-pregnant non-lactating rural women (NPNL) of reproductive age group (18-40 years) at Dumki upazila of Patuakhali district of Bangladesh. The study involved interviews using a questionnaire, measurement of food/nutrient intake, anthropometry, observations of clinical signs of morbidities and assessment of their general knowledge and awareness about health, nutrition and sanitation. According to BMI 13% of the participants were found underweight, 44% of the participants were found normal, 18% of the participants were found overweight and Class I obesity, Class II obesity, Class III obesity of the respondents were found 18%, 4% and 3% respectively. The ratio of samples with excellent WHR, i.e. <0.75 was found to be 6% & 0.75-0.79 was found to be 15% while 32% fell under 0.80- .86 category and 7% were found to have  $\geq$  .86 WHR indicating increased health risks for women due to excess fat in the abdominal region. The overall quality of food and nutrient intake was poor as the intake of all the food groups (except fats, sugars and milk and milk products) was found to be much lower than their RDAs. The mean intake of the major seven food groups, namely, cereals and pulses, milk and milk products, meat and poultry, vegetables, fruits, fats and oils and sugars are 148 ( $\pm$ 46.8)g, 270 ( $\pm$  129)g, 0.29 ( $\pm$ 0.85)g, 82 ( $\pm$ 50.7)g, 34 ( $\pm$ 46.6)g, 18 ( $\pm$ 16.4) g and 21 ( $\pm$ 17.6)g, respectively. The morbidity rate increases according to their increase in age. Dietary deficiencies were also present in NPNL women of Dumki reflecting their effects in the clinical signs like pale conjunctiva skin disorder, menstrual problems and pregnancy complications, etc. The study reveals that women under old age bracket are suffering from more diseases than the other groups of women. Due to the biological changes in their different phases of life, the morbidity rate of the women is different for different phases. Efforts are needed to improve diet quality and education for rural NPNL women so that they rise in economic status and are better nourished.

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### I. Introduction:

Nutrition is one of the most important factors influencing the quality of human life. Nutritional status is an important health indicator to assess a country's health status and morbidity pattern. In developing countries, women mature bearing obvious evidence of deprivation in childhood, namely stunting. Nutritional disorders are very frequent in women and involve a high risk of morbidity and mortality. Studies on nutritional status are very important in the women of childbearing age because of low to moderate prevalence of possible deficiencies. The relationship between nutritional status and health of mothers and newborns is well documented. Morbidity and mortality are inversely related to socio-economic status. In Bangladesh, natural calamities, such as devastating floods, prolonged droughts, destructive cyclones, often aggravate the nutritional deficiencies. These disasters cause high unemployment, elevated food prices, reduced food stock and a high scarcity of food, all of which have a marked impact on poor rural inhabitants and wage laborers households. Moreover, during natural disasters, increased gender discrimination has been observed in previous studies, with a disproportionate increase in female mortality in severe food crises. Negative energy balance and chronic malnutrition have been reported in low income breast-feeding mothers in Bangladesh. As per 2015 census, the total population of Bangladesh is 156,186,882 (July 2016 est.) out of which 0-14 years: 28.27% (male 22,456,564/female 21,695,491), 15-24 years: 19.53% (male 15,261,363/female 15,247,635), 25-54 years: 39.39% (male 29,565,250/female 31,951,537), 55-64 years: 6.77% (male 5,232,828/female 5,342,822), 65 years

and over: 6.04% (male 4,493,557/female 4,939,835) (2016 est.). It is a country where 65.7% of the population resides in a rural area and males significantly outnumber females, an imbalance that has increased over time. The urban population 34.3% of total population (2015) rate of urbanization: 3.55% annual rate of change (2010-est.)

The typical female advantage in life expectancy is not seen in Bangladesh and this suggests there are systematic problems in women's health care. In Bangladesh women have high mortality rates, particularly during childhood and in their reproductive years. Bangladesh's maternal mortality rates are 176 deaths/100,000 live births (2015 est.). The health of Bangladesh women is intrinsically linked to their status in society, especially for those living in a rural area. Research into women's status in society has found that the contributions Bangladesh women make to families are often overlooked. Instead they are often regarded as economic burdens. There is a strong preference for sons in Bangladesh because they are expected to care for ageing parents. This son preference and high dowry costs for daughters result in the mistreatment of daughters. Indeed, Bangladeshi women have low levels of both education and formal labor-force participation. They typically have little autonomy, living first under the control of their fathers, then their husbands, and finally their sons. These factors have a negative impact on the health status of Bangladesh women. Poor health has repercussions not only for women, but also their families. Women in poor health are more likely to give birth to low weight infants. They are less likely to be able to provide food and adequate care for their children. Finally, a woman's health affects the household's economic wellbeing because a woman in poor health will be less productive in the labor force. In rural areas where women are less educated and economically deprived, their health condition is worse. In the context of health as defined by WHO – 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' – one must ask how this can be achieved for Bangladeshi women.

About 75% of health infrastructure, medical manpower and other health resources are concentrated in urban areas where 28% of the population live and only 25% of medical facilities are concentrated in rural areas where 72% of people live (NFHS-3 data). Contagious, infectious and waterborne diseases such as diarrhea, amoebiasis, typhoid, infectious hepatitis, worm infestations, measles, malaria, tuberculosis, whooping cough, respiratory infections, pneumonia and reproductive tract infections dominate the morbidity pattern, especially in rural areas. However, non-communicable diseases such as cancer, blindness, mental illness, hypertension, diabetes, HIV/AIDS, accidents and injuries are also on the rise.

According to NFHS III data, more than a third (36%) of women has a BMI below 18.5, indicating a high prevalence of nutritional deficiency. Among women who are thin, 44% are moderately or severely thin. More than half of the women (55%) are anemic as depicted by NFHS III survey. Less than one-third of women in the lowest wealth quintile consume milk or curd at least once a week, as do less than half of women in the second wealth quintile. More than half of women in the three highest wealth quintiles consume milk or curd at least once a week. In the highest wealth quintile, three-quarters of women consume milk or curd at least once a week. The differentials in food consumption are even sharper for the consumption of fruit. Weekly consumption of fruit increases from 16 percent in the lowest wealth quintile to 72 percent in the highest wealth quintile. The health status of Bangladesh is still a cause for grave concern, especially that of the rural women. This is reflected in the life expectancy (70.7 years), infant mortality rate (30/1000 live births), maternal mortality rate (176/1000 live births) (World Bank data); however, over a period of time some progress has been made. To improve the prevailing situation, the problem of rural health is to be addressed both at macro (national and state) and micro (district and regional) levels. This is to be done in a holistic way, with a genuine effort to bring the poorest of the population to the center of the fiscal policies. A paradigm shift from the current 'biomedical model' to a 'socio-cultural model', which should bridge the gaps and improve quality of rural life, is the current need. A revised National Health Policy addressing the prevailing inequalities, and working towards promoting a long-term perspective plan, mainly for rural health, is imperative.

Diet and nutrition are important factors in the promotion and maintenance of good health throughout the life cycle. Income, prices, individual preferences and beliefs, cultural traditions, as well as geographical, environmental, social and economic factors all interact in a complex manner to shape dietary consumption patterns and affect the morbidity and clinical status of women. A normal balanced diet must include daily foods from the various food groups in enough amounts to meet the needs of an individual and to increase immunity.

**Body text:**

## **II. Result and Discussion:**

A total of 100 samples from the study area were included in the analysis. Various criteria like socio-economic profile, anthropometry, food consumption pattern, medical history, general awareness and practices were studied and analyzed, and the data presented below.

### **1. Background profile**

The data are collected regarding personal profile, family profile, income status and anthropometric measurements and the results presented herewith

**1.1 General information of the Subjects Personal Profile**

Table 1 shows the distribution of the study participants by class, age groups and food habit. Nearly 34% percent class of the participants was attending college and university level, 2 percent were attending primary level and 40 percent were Secondary level. According to age group, most of the participants were 26 to 30 years old, being 46 percent of the total, 21 percent were 18 to 25 years old and 33 percent were 30 to 40 years. The mean age of the study group was found to be 29 years and the mean age at marriage was 18 years. According to food habit most of them non- vegetarian

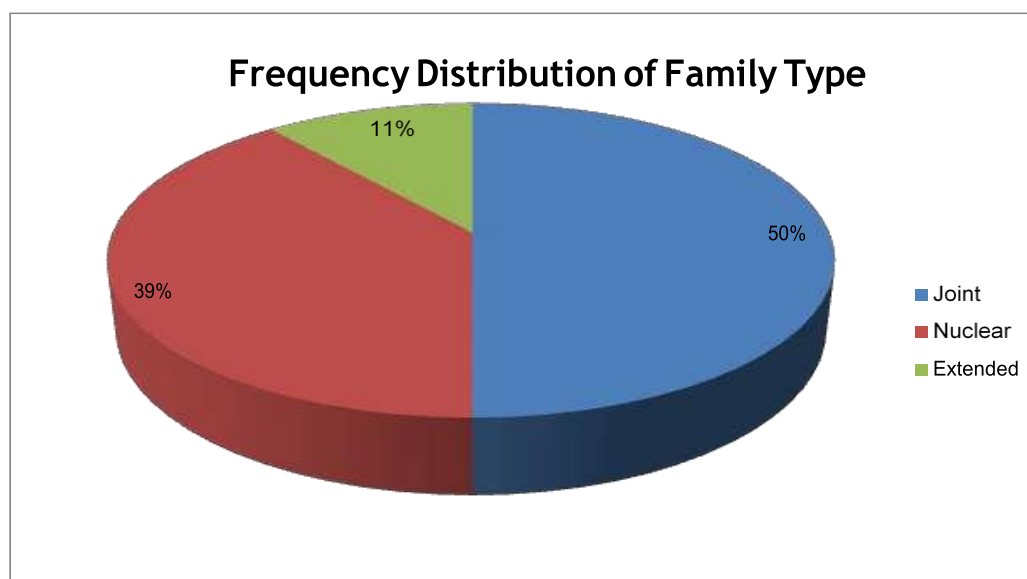
**Table 1: Personal profile of the subjects (n=100)**

Personal variables	Frequency (%)
<b>Food Habit</b>	
Vegetarian	01
Non-vegetarian	99
<b>Marital Status</b>	
Single	13
Married	82
Divorced	5
<b>Education</b>	
Primary level	26
Secondary level	40
College level	25
University level	9
<b>Age Group(year)</b>	
18-25	21
26-30	46
31-45	33

The data shown in table 1 depicts that majority of the samples were married. The frequency of subjects from single married & divorced were 13%, 82% and 5% respectively. In the figure 1 shown that majority sample were high school level.

**Family Profile:**

The data regarding the family profile of the study group is discussed in Table 2 and Figures 1, 2, 3 and 4. The mean number of family members was found to be 8 as majority (50%) of the subjects was living in joint family. The data related to the type of family, occupation, activity pattern and monthly income is shown in the Table 2.



**Figure: 1 Frequency distribution of family type**

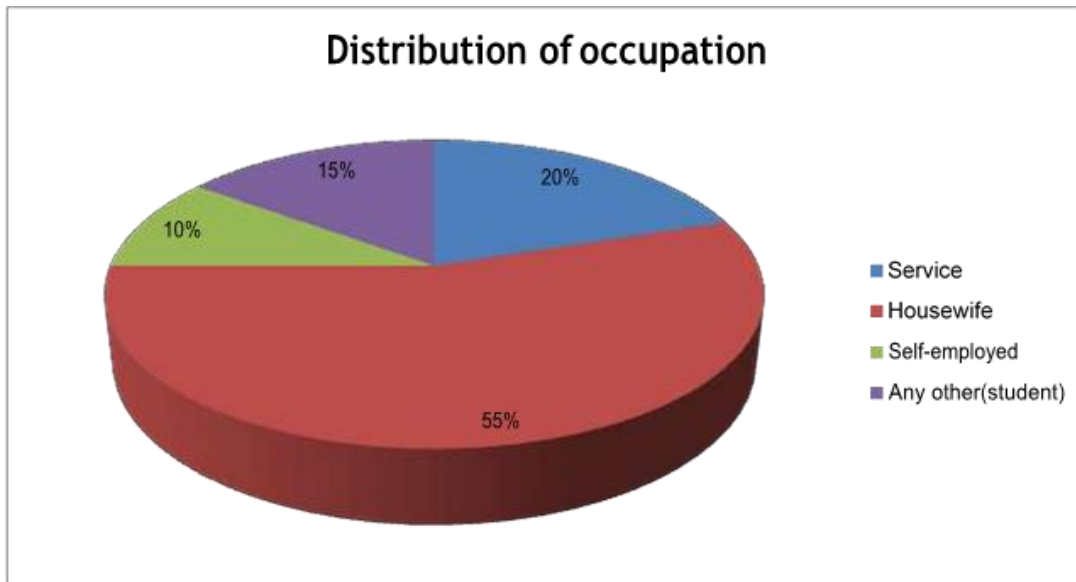


Figure: 2 Frequency distribution of occupation

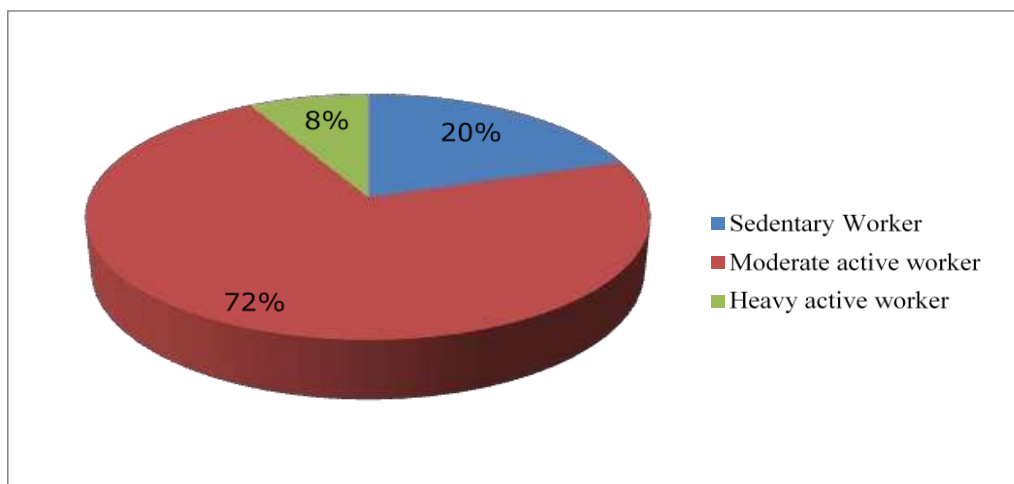


Figure 3 Frequency distribution of activity level

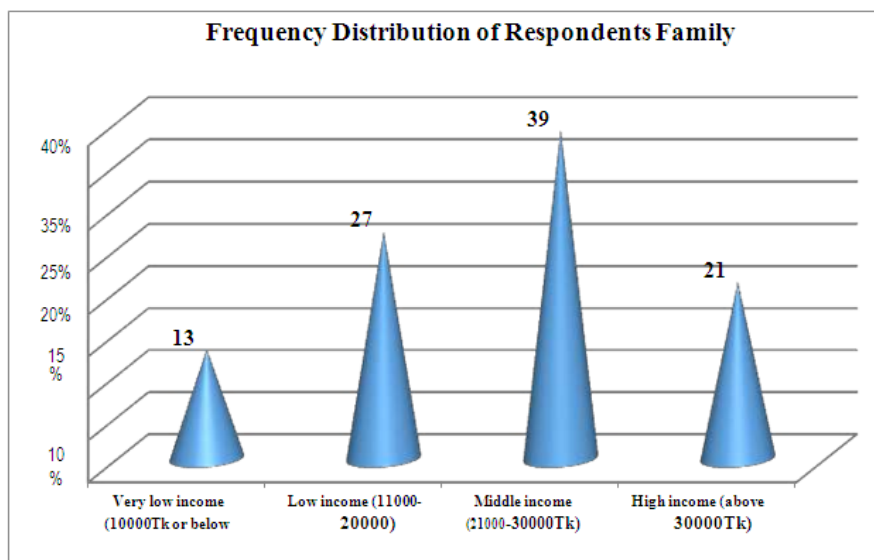


Figure 4 Frequency distribution of income level

The data presented in Figures 1, 2, 3 and 4 shows that about 39% of the samples were residing in nuclear families and 11% in extended families compared to 50% in joint families, which shows the decreasing joint family trend among rural population as well. The major family occupation was found to be service/jobs (50%) and self-employment 10 %) compared to agriculture (%). The major respondent's family income is middle level and that is 39%

**Anthropometrical Measurements**

**1.2 Body Weight**

Mean (+ standard deviation) median and range of the participants body weight were 58.82 (+10.6) Kg 60kg and 39 to 85 kg respectively.

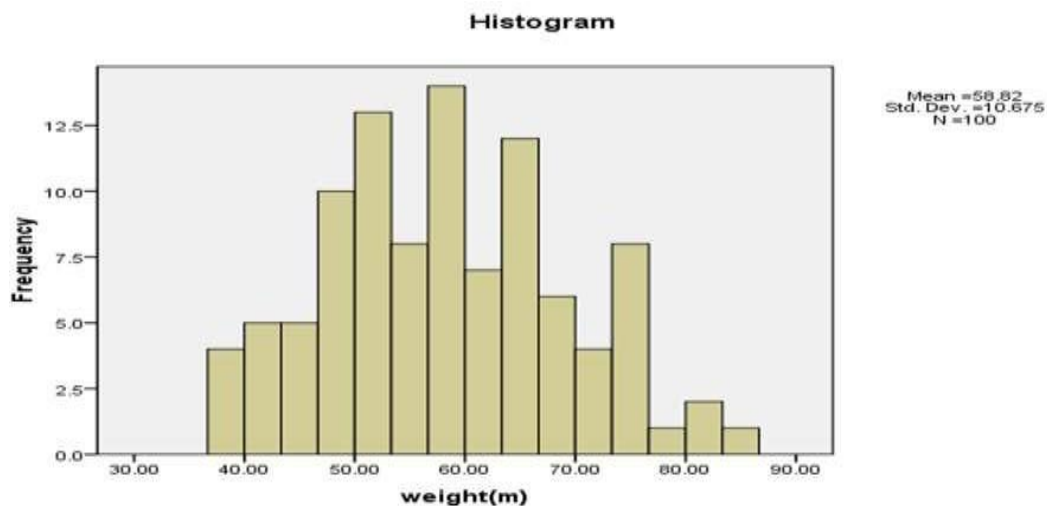


Figure: 5 Weights respondent's

**Height**

The mean (+standard deviation) height was 4.96 (+0.34) ft., with a median of 5ft and ranged from 4.1 to 6.2 ft.

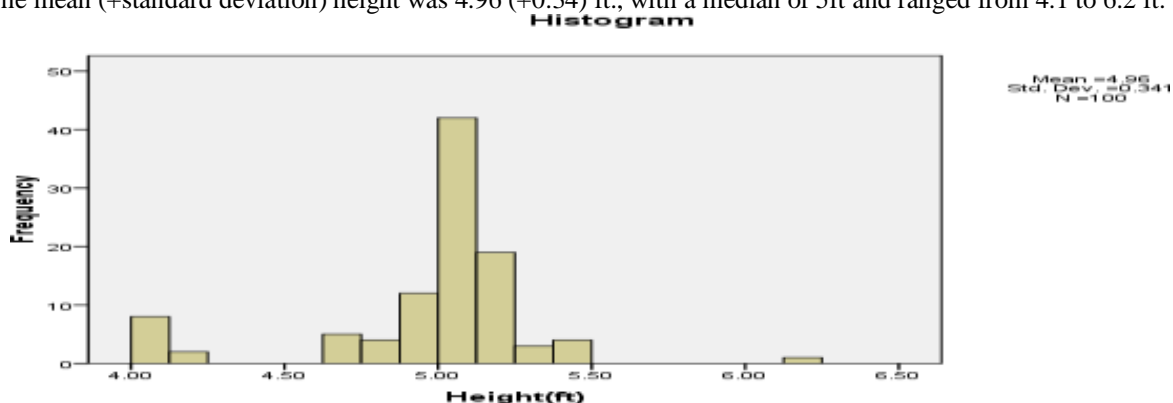


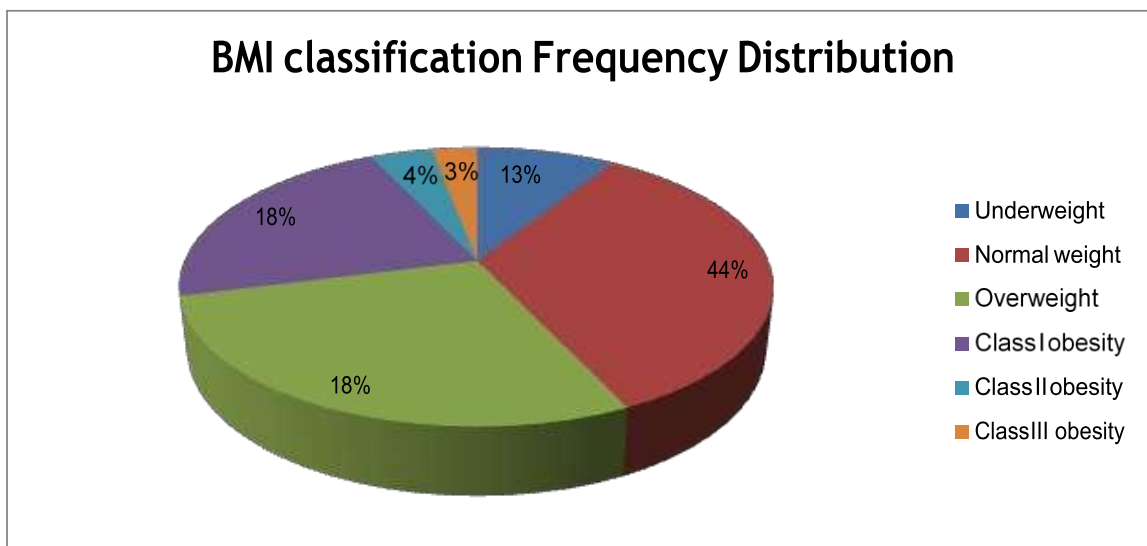
Figure: 6 Height of respondent's

**1.2.1 BMI (Body Mass Index)**

The data regarding the height, weight and BMI of the samples is shown in the Table 2 and Figures 7

**Table 2: Body Mass Index**

BMI	Classification	Frequency
<18.5	Underweight	13
18.5–24.9	Normal weight	44
25.0– 29.9	Overweight	18
30.0–34.9	Class I obesity	18
35.0–39.9	Class II obesity	4
≥ 40	Class III obesity	3



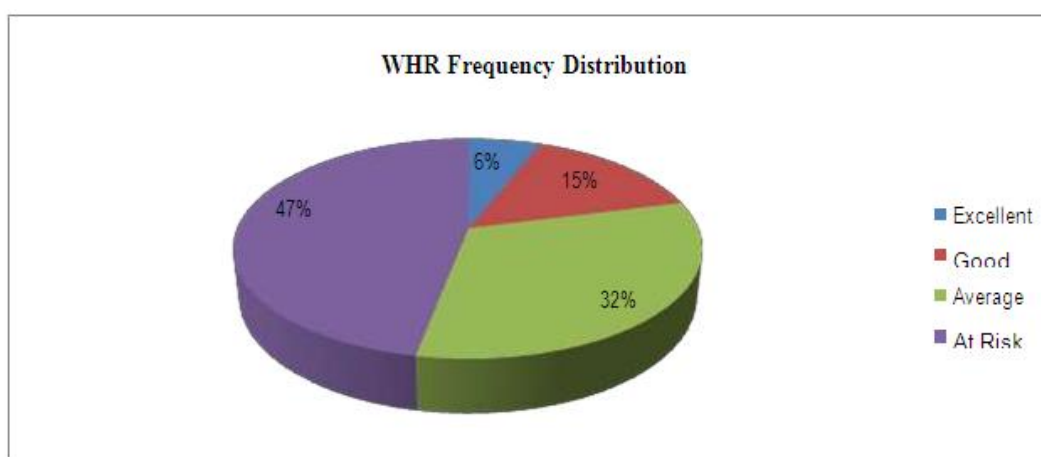
**Fig: 7** Frequency distribution of respondent's nutritional status based on BMI

According to BMI 13% of the participants were found underweight, 44% of the participants were found normal, 18% of the participants were found overweight and Class I obesity, Class II obesity, Class III obesity of the respondents were found 18%, 4% 3% respectively that shown in figure 7

### WHR (Waist Hip Ratio)

The data regarding the waist, hip and WHR of the samples is shown in the Table 3 and Figure 8

WHR	Classification	Frequency
<0.75	Excellent	6
0.75-0.79	Good	15
0.80-0.86	Average	32
≥ 0.86	At Risk	47



**Figure: 8** Frequency distribution of respondent's nutritional status based on WHR

The ratio of samples with Excellent WHR, i.e. <0.75 was found to be 6% & 0.75-0.79 was found to be 15% (Good) while 32% (Average) fell under 0.80-0.86 category and 47% were found to have ≥ 0.86 WHR indicating increased health risks for women due to excess fat in the abdominal regions

### Food and Nutrient Intake

#### 1.3 Meal intake per day

The data related to food intake and nutritional status was collected through food frequency questionnaire and presented herewith

**Table 4: Frequency Distribution of Intake of Meal Including Snacks of People per Day**

Times per day	Frequency	Percent
2 times	9	9
3 times	87	87
4 times	3	3
5 times	1	1

This table 4 shows, 9% People intake meal 2 times including snacks in a day, 87% People intake meal 3 times including snacks in a day, 3% people intake meal 4 times & 1% people including snacks per day in the study area.

**1.3.1 Food Intake Data**

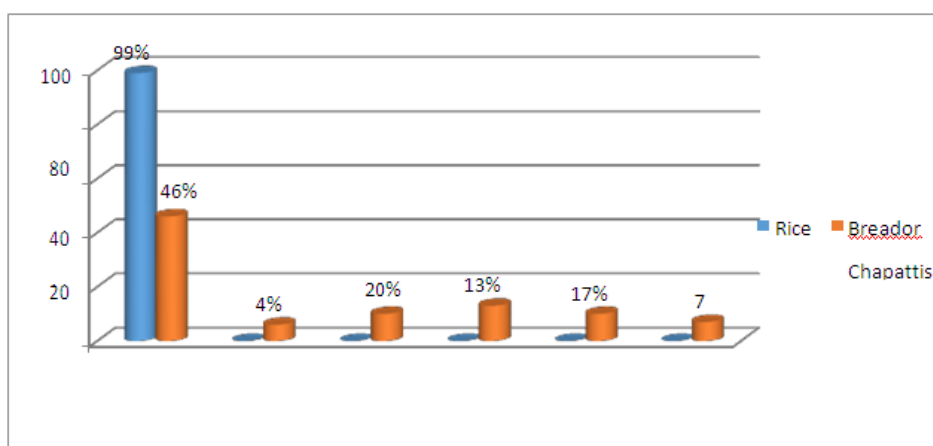
The food intake for all the participants are shown in table 5 and Figure 9, 10, 11, the percentage adequacy of the food groups and their mean intakes are presented along with their Recommended Dietary Intakes (RDI). The mean intake of the major seven food groups, namely, cereals and pulses, milk and milk products, meat and poultry, vegetables, fruits, fats and oils and sugars are 188 ( $\pm 45.8$ ) g, 250( $\pm 129$ ) g, 5( $\pm 0.85$ ) g, 200( $\pm 50.7$ ) g, 45( $\pm 16.6$ ) g, 25( $\pm 15.4$ ) g and 21 ( $\pm 17.6$ ) g, respectively.

**Table 5: Food Intakes**

Food groups	RDI (g)	Mean Intake $\pm$ SD(g)	% Adequacy
Cereal and pulses	300	188 ( $\pm 45$ )	49
Milk and milk products	300	0 ( $\pm 129$ )	85
Meat and poultry	30	( $\pm 0.85$ )	4
Vegetables	300	( $\pm 50.7$ )	54
Fruits	100	45 ( $\pm 1$ )	39
Fats and oils	20	25 ( $\pm 15$ )	87
Sugars	20	21 ( $\pm 17.6$ )	100

**1.3.1.1 Cereals, Grains and Products Consumption of the People Monthly**

Figure 9 shows that in case of rice, 99% were found to consume rice daily, 1% participants is consumed it 5-6 days per week. 46 percent people consume bread daily



**Figure: 9** Frequency distribution of cereals and pulses product

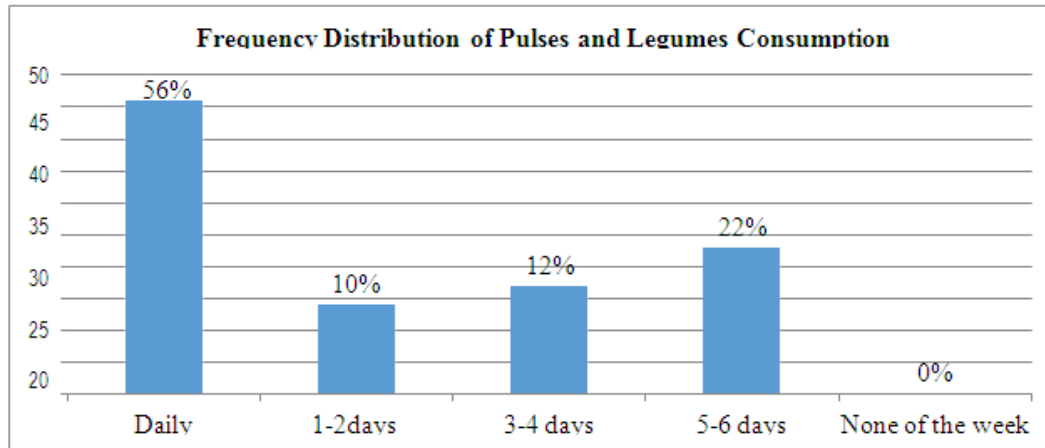


Figure: 10 Pulses and legumes consumption

**1.3.1.2. Pulses and Legumes Consumption of the Respondent's**

In case of cereal group, only 56% were found to consume it daily, 22% consumed 5-6 a week and rest consumed it occasionally

**1.3.1.3 Meat and Meat Products Consumption of the People Month**

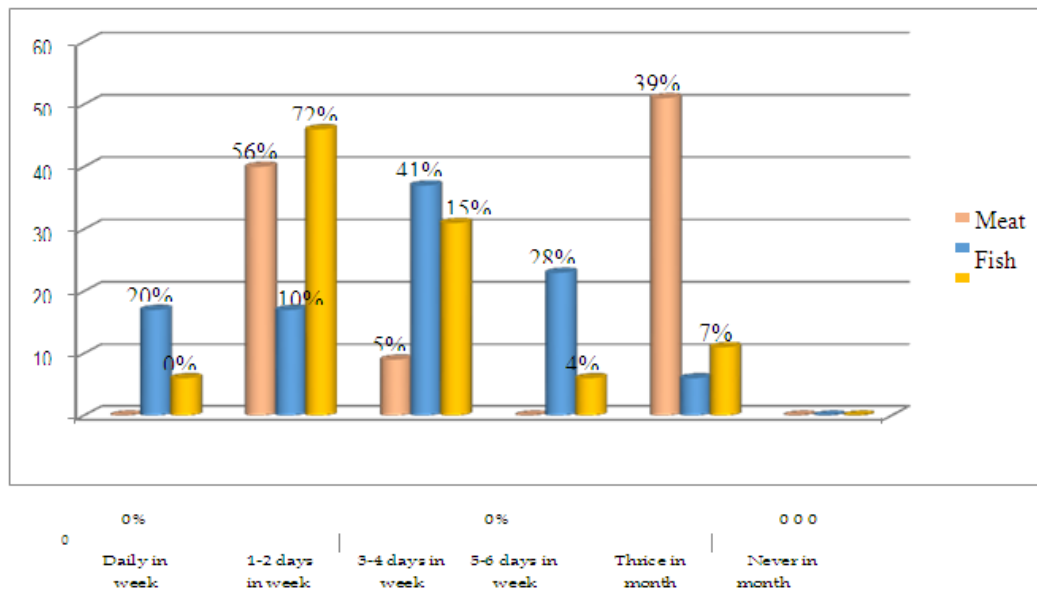
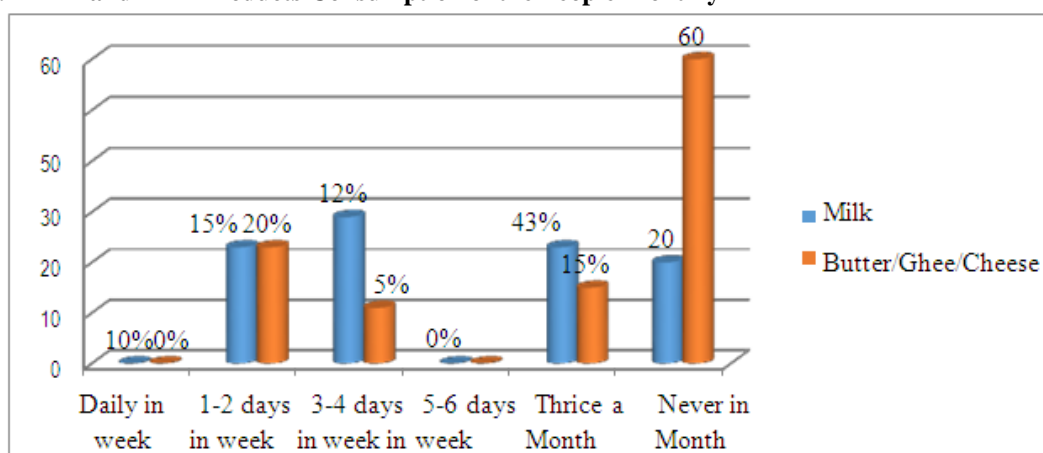


Figure: 11 Meat and meat products consumption

Figure 11 shows that 56% participants are consume meat 1-2 days per week, 5% are consume it 3-4 days per week and 39% consume it thrice in month. It also show that 20 percent people consume fish daily, 10 percent consume 1-2 days per week, 41% consume it 3-4 days per week. In this figure 72 percent respondents consume egg 1- days per week.



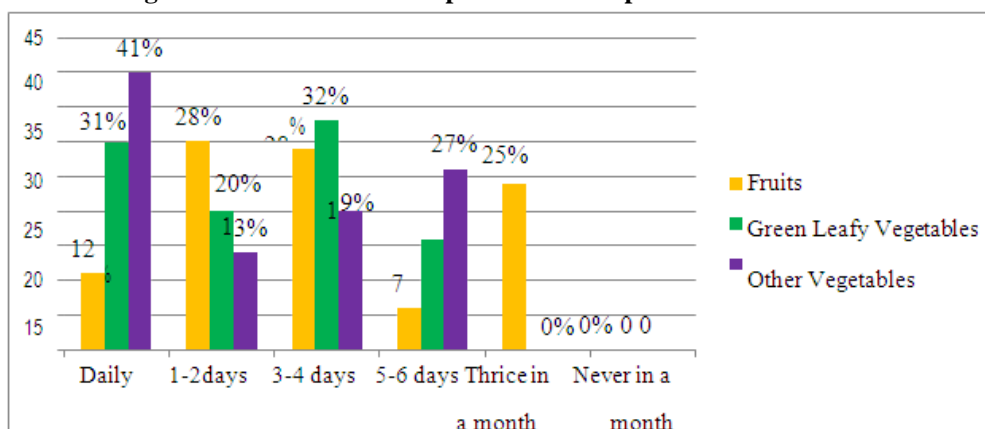
**1.3.1.3. Milk and Milk Products Consumption of the People Monthly**



**Figure: 12 Milk and milk products consumption**

Figure 12 show that 15% participants are drinking milk 1-2 days per week, 12% are drinking it 3-4 days per week, 43% thrice in month and 20% consume it occasionally. 60% participants are never intake butter or cheese in a month

**1.3.1.5 Fruits and Vegetables Products Consumption of the People**



**Figure: 13 Fruits and vegetables products**

In case of green leafy vegetables, only 34% were found to consume it daily, 23% consumed 1-2 days per a week and rest consumed it occasionally. Similar were the findings in case of fruits wherein only 12% of samples consumed some fruit daily, rest consumed it weekly or occasionally

**Table: 6: Medical History**

SL	Disease	No. & Frequency	SL	Disease	No. & Frequency
1	Pale conjunctiva	4	11	Joint pain	35
2	Wormsin stools	10	12	Chicken pox	0
3	Skin disorders	17	13	Common cold	17
4	Asthma	7	14	Diabetes	6
5	Diarrhea	12	15	Defective vision	9
6	Gum problem	2	16	Tuberculosis	0
7	Goiter	0	17	Pregnancy complication	41
8	Heart Attack	2	18	Menstrual problem	36
9	Hypertension	26	19	abdominal pain	17
10	Jaundice	3	20	Depression	36

The data presented in Table 6 shows that the most prevalent diseases among females were pregnancy complication (41%), menstrual problems (34%), Joint pain (35%), Skin disorder (17%) and Depression (36%) which could be attributed to their lower iron, Calcium & vit. -A intake. The common menstrual problems included acne, backache, sore breasts, fatigue, constipation, irritability etc. and the common pregnancy complications included constipation, pica, nausea, vomiting, edema, back pain etc. The other common problems were common cold, hypotension, Diarrhea, abdominal pain & Worms in stools with the frequencies 17%, 26% and 12%, 17% & 10% respectively

#### 1.4 Correlation

##### Correlation between Frequency of Disease and BMI [Pearson Correlation, Sig. (2-tailed), N=100]

The data related to the co-relation between the occurrence and frequency of various diseases and the BMI of samples is shown in Table 7

**Table 7: Co-relation between Frequency of disease & BMI**

	Frequency of disease	BMI
Frequency of disease	1	- 0.102*
BMI	- 0.102*	1

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

The data given in Table 7 depicts that BMI (Body Mass Index) showed a negative relation with the number and frequency of diseases, i.e. the frequency of diseases was found to be more among underweight females than females with normal BMIs.

##### 1.4.1 Correlation between General Awareness and Frequency of Disease

**Table 8: Co-relation between general awareness and disease**

	General awareness	Frequency of disease
General awareness	1	
Frequency of disease	-0.438**	1

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

The frequency and number of diseases showed a perfect negative co-relation with the general awareness. The females who were more aware about the general health and hygiene suffered from lesser no. of diseases

##### 1.4.2 Correlation between Education Level and Number of Child [Pearson Correlation, Sig. (2-tailed), N=100]

**Table 9 Correlation between Education level and number of children**

	Education level	Number of children
Education level	1	-0.467**
Number of children	-0.467**	1

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

The frequency and number of children showed a perfect negative co-relation with education level. The females who were high educated have child birth rate less than low educated female

##### 1.4.3 Correlation between BMI and WHR and Other Variables [Pearson Correlation, Sig. (2-tailed), N=100]

The data related to the co-relations between BMI and WHR regarding health & hygiene and various other variables like hip, waist, weight, pregnancy wastage etc. is depicted in Table 10

	BMI	WHR
BMI	1	.247*
WHR	.247*	1
Hip in cm	*233*	.87
Pregnancy wastage	-218*	.003
Weight in kg	.582**	.336**

Waist in cm	.274**	.213*
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\*\* . Correlation is significant at the 0.01 level (2-tailed).

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

The data given in Table 10 shows that WHR of the females was positively co- related with BMI, i.e. younger females were better WHR than the older females.

The hip shows a perfect positive co-relation with BMI and WHR. This means that with better BMI and WHR, the health status of females increased

The pregnancy wastage showed a perfect negative co-relation with BMI. The females who were underweight had more no. of abortions or still births than the normal BMI female. The child mortality rate is high in underweight female

BMI and WHR showed a perfect positively co-relation with the weight. That mean BMI &WHR professionally change according to weight

BMI and WHR showed a perfect positively co-relation with the waist. That mean BMI &WHR professionally change according to waist.

### 1.5 Management of Environmental and Personal Hygiene

Hygiene is one of the most important conditions for good health (Paul, 1977). Components of environmental and personal hygiene that directly or indirectly influence their normal health management practices include household environment, personal, family and environmental cleanliness, family size, educational qualification, occupation, monthly income, sources of bathing, drinking and cleaning water, sanitation systems, post toilet hand-washing habit, smoking habit, family planning and vaccination, care of pregnant mothers and babies, dental care, etc. (Helman, 1990). Influences of these factors on the health management practices of the women were studied and analyzed in this survey work. The findings are discussed below:

### 1.6 Household Environment

**Table 11: Type of house**

Type of House	Frequency (%)
Brick Built	25
Brick with Tine Built	23
Tin Built Houses	52

Housing is one of the most complex elements of environmental health and is intimately linked with economical, physical and social conditions, customs and tradition. House number and structure, density of population in a house, hygienic conditions, etc. of any separate entity directly or indirectly control its health management efforts and exert definite effects on the health status of the household people. From the study, it was observed that the number of bricks built, brick with tine built and tin built houses of the participants in the study area were 25%, 23% and 52% respectively

### 1.7 Sources of Drinking, Bathing and Cleaning Water

Participants were generally found to be careful about drinking water. Most of them in the study area were found to use tube-well or puller-pump water for drinking purposes. 95% of the respondents use water from tube-well and only 5% from puller- pump for drinking purpose. 100% of the participants of the study area were habituated to regular bath. This is really a good habit in respect of health management practices

### 1.8 Sanitation

**Table 12: Type of toilet facility**

Type of Toilet	Frequency (%)
Sanitary toilet	21
Semi-sanitary toilet	34
Mud-built/Slab toilet	45

Observations revealed that almost all the families of the study area have at least one toilet of their own. The percentages of Sanitary, Semi-sanitary and Mud-built/Slab toilet users were 21%, 34% and 45% respectively. There were no toilets with flushing and water sealed systems in the study area. However, the sanitation system in the area is better than that in the mainland, because 36.90% of the mainland population

have no toilet facilities. They excrete their feces in the open fields or under bushes. Thus, indiscriminate scattering of human fecal and garbage pollute the nearby water sources, which results in infectious diseases like diarrhea, dysentery, typhoid, fever, hepatitis, worm infection and gastroenteritis so common with the mainland people. Participants are comparatively in a better position in respect of these diseases

### 1.8.1 Post-toilet Hand Washing

Most of the respondents (78%) were in the habit of using soap for post-toilet hand washing. In an average 22% of the respondents were habituated to using ashes for this purpose. Better sanitation system and post-toilet hand washing practices of the participant have positive impacts on their overall healthy environment and better health status

### 1.9 Dental Care

**Table 13: Type of dental care**

Type	Frequency (%)
Toothpaste and toothbrush	45
Tooth powder	47
Neem-sticks	9
Bush-sticks	6
Black ashes	3

Participants were generally found to be careful about dental health. It was found that, for dental cleaning, 45% of the respondents use toothpaste and toothbrush, 37% use tooth powder, 9% Neem-sticks, 6% bush-sticks and 3% black ashes. Most of them clean teeth in the morning only, not at the bed time. Only the literate (20%) were habituated to brushing teeth at night.

### 1.10 Family Planning

**Table 14: Family planning method**

Family planning method	Frequency (%)
Birth control injections	55
Birth control pills	26
Condoms	11
Adopted ligation	8

51% of the respondents answered positively about family planning. The survey revealed that for birth control 55% of the respondents used birth control injections, 26% used birth control pills, 11% used condoms and 8% adopted ligation. It was observed that most of the respondents prefer Injection as a means of birth control. This was because injections are easily available free of cost in the local Christian hospitals.

### III. Conclusion:

Health and morbidity related problems are very common to Bangladeshi women. This study is designed to identify potential factors for health and morbidity of women. In the study, Statistical techniques are performed to discover association from acquired secondary data. The study shows, type of place of residence, age at marriage, marital duration, wealth index, educational level, respondents Weight, respondent's height, vaccination, diseases, sanitation and community hygiene practices have significant effect on nutritional status and morbidity of women. According to BMI in this study find that 13% underweight, 44% normal weight, 18% overweight and 25% obese. The mean age at first marriage is found only 17.17. The legal age of marriage in Bangladesh for women is 18 years, but a large portion of marriages still take place before the legal age. Finally, we can say from this study that the overall dietary Intake pattern of rural non-pregnant non- lactating in Bangladesh is poor. Female education is a vital aspect of changing health services and plays an important impact on the socio-economic well-being of individuals. So looking at the importance of health in our day to day life and the role of women in that, the present study was conducted to assess the nutritional status and morbidity patterns among non-pregnant non-lactating rural women of reproductive age group (18-40 years). Bangladesh is the highest among women with no education which influence increasing morbidity. Concerning the current situation, alternative steps might be taken by government and non-government organizations. The government should pay an attention to ensure health status and the existing marriage act (where the age at first marriage for women is 18 years) to prevent the early marriage in Bangladesh. More working opportunities must create for women in Bangladesh by the Government and others.

### **Acknowledgement:**

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