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# Diet and Cardiovascular Diseases Risk: A Case – Control Study at Kushtia, Bangladesh

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**Abstract:** This was a descriptive cross sectional study with purposely selected sample 230 cardiac patient conducted in kushtia sadar Hospital, kushtia. The study was conducted to assess the relation between cardiovascular diseases and dietary patterns of patients suffering from cardiovascular disease. Study results presented that about 26.5% patients were affected in stroke; 34.8% patients were affected in heart attack; 17.4% patients were affected in coronary heart disease. Out of total patients, 56.1% were overweight; 22.2% were obese class I; 29.1% male and 15.2% female were centrally obese by their waist circumference; 47.0% male and 34.8% female were centrally obese by their waist-hip ratio. BMI  $28.38 \pm 3.16$  in male and  $26.75 \pm 4.62$  in female, WC (cm)  $88.70 \pm 9.18$  in male and  $81.45 \pm 11.25$  in female and the difference was significant. Waist circumference (WC) was significantly ( $p=0.000$ ) correlated with Waist-Hip ratio and dietary diversity score; BMI also correlated with WC. Most of the respondents did not know the symptoms of heart disease and dietary knowledge were very poor among the cardiac patients. The findings of the study shows that the prevalence of cardiovascular disease was high among those with positive family history, lower education, poor dietary knowledge, physically inactive, overweight or obese and those with higher WC, WHR were found to have a significant effect on the prevalence of CVD.

**Keywords:** Cardiovascular Disease (CVD), Nutritional Status, Dietary Patterns

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## 1. Introduction

Cardiovascular disease (CVD) is the main reason of death and disability worldwide. According to the Global Burden of Disease study, ischemic heart disease and stroke accounted for 25% of total losses universal in 2013 [7]. The existing widespread of CVD is mostly described by numerous changeable threat factors linked with lifestyle, possible to change. In this logic, an inappropriate diet, extreme alcohol and tobacco ingesting, hyperlipidemia, diabetes, hypertension, obesity, physical inactivity and mental stress rise the risk of upcoming CVD occasions and are accountable for an assessed 90% of the population-attributable risk portion of ischemic heart disease and stroke universal [4, 6, 10, 12]. Even extra tension-related emotional complaints such as sadness display a greater prevalence in patients with CVD related with the others population [5, 8, 9]. Chronic or acute contact to tension favors to the weakening of the active

equilibrium of the organism, and its reply encourages the discharge of biochemical mediators that disturb the metabolic and social state in persons. Stress-induced initiation of the neuroendocrine hypothalamic-pituitary-adrenal axis (HPA), once contact to a stressor cortisol is estimated to apply widespread metabolic special effects, which is regularly required to preserve or repair homeostasis. Emotional stress is the trigger in the torrent of neuroendocrine special effects that initiate the improvement of the visceral circulation of adipose tissue, resistance to insulin and the resultant hyperinsulinemia, thus principal to the gathering of cardiovascular risk elements [11]. Since glucocorticoids service improved adiposity, mostly, abdominal fat, they can lead to improved hunger, offensive the amount and quality of the food (improved sugary and rich fat food consumption), and body mass increase. Thus, contact to tension can change consumption practice. Though an association between dietary changes and stress and mind health is already recognized to exist, the careful nature of this association has not been

recognized. Infections of the gut have been connected to various psychological sicknesses such as tension and sadness, though the molecular paths convoluted have not still been clear up [1].

## 2. Materials and Methods

### 2.1. Study Design

A descriptive cross sectional study was conducted in kushtia sadar hospital to collect data from cardiac patients and patients were selected purposely. To conduct the study, data were collected from cardiac patients on various socio-demographic, economic, lifestyle, anthropometric, biochemical, clinical, dietary and awareness related information.

### 2.2. Study Location

The study was conducted at kushtia district in Bangladesh. Cardiac patients were included from kushtia sadar Hospital, kushtia where patients from various districts of Bangladesh came to take treatment for cardiovascular disease. The rationale of choosing the place was to collect proper information from target population.

### 2.3. Study Population

The study population was cardiac patients of kushtia sadar Hospital in kushtia. Where the patients were came from various districts of Bangladesh.

### 2.4. Selection Criteria

The primary selection criteria were any patients suffering from any types of cardiovascular disease.

### 2.5. Sample Selection Procedure

Information was collected from patients suffering from cardiovascular disease and patients were selected by using convenient sampling.

### 2.6. Sample Size

Two hundred cardiac patients were selected purposively for interview to collect proper information.

### 2.7. Data Collection Method

Data were collected from the cardiac patients by face to face interview. A well-structured questionnaire was used in the study so that information regarding nutritional status, food intake pattern, and dietary awareness of cardiac patients was captured.

#### Clinical Information:

Clinical information includes clinical symptoms of the respondents and this information was recorded from the respondent's self-reported symptoms.

#### Dietary Information:

A 24 hours dietary recall method was used to collect information about foods consumed during the 24 hours

period of the previous day. 30 days diet history of the respondents was recorded to collect information about food intake pattern for the past one month in which foods are classified into 16 food groups.

### 2.8. Data Processing and Analysis

The data record was started instantly after finish of data collection. The obtained data was tested, confirmed and then record into the computer. Only totally completed questionnaires was recorded into the computer for final analysis of data. STATA and SPSS software was used for data analysis.

## 3. Result

Our study was selected 137 male and 93 female respondents. There was maximum age above 40 year. Maximum respondents received primary education and about 50% of respondents were illiterate. Their maximum income level was 10000 - 20000 taka per months.

*Table 1. Socio demographic status of the respondents.*

Characteristics	Frequency	Percentage	
Gender	Male	137	59.60
	Female	93	40.40
Age group	30-40 years	15	6.50
	41-50 years	74	32.20
	51-60 years	79	34.30
	>60 years	62	27.00
	Illiterate	50	21.70
Level of Education	Primary studies	76	33.10
	Secondary studies	70	30.40
	Higher studies	34	14.80
Level in income per months	<10000 taka	70	30.40
	10000 - 20000 taka	123	53.50
	21000 - 30000 taka	11	4.80
>30000 taka	26	11.30	

From the table 2 it is found that 53 (23.0%) patients had diabetes; 88 (38.21%) patients had hypertension; 19 (8.3%) patients had chronic kidney disease; 14 (6.1%) patients had asthma and 56 (24.3%) patients had others disease. It seems that diabetes and hypertension are more prevalent among cardiac patients.

*Table 2. Frequency and percentage distribution of respondents according to the type of other diseases besides cardiovascular disease.*

Type of other disease	Frequency	Percentage
Diabetes	53	23.0%
Hypertension	88	38.2%
Chronic Kidney Disease	19	8.3%
Asthma	14	6.1%
Others	56	24.3%
Total	230	100%

From the figure 1 it is found that 46.10% respondents were sedentary; 40.40% respondents were moderate and 13.50% female respondents were active. It shows that cardiac patients were more sedentary.

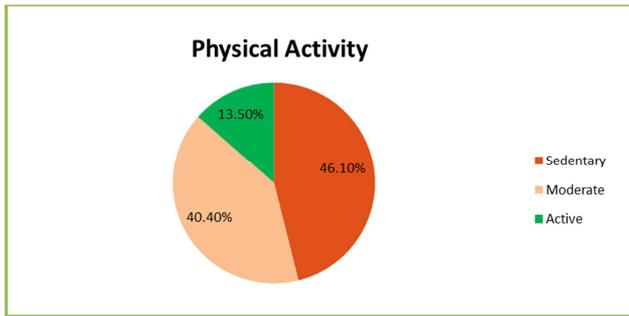


Figure 1. Pie chart presentation for the percentage distribution of cardiac patients according to physical activity.

From the Figure 2 it is found that 2.6% respondents were underweight; 16.1% were normal; 56.1% were overweight; 22.2% were obese class I; 3.0% obese class II. It also found that most of the respondents were overweight.

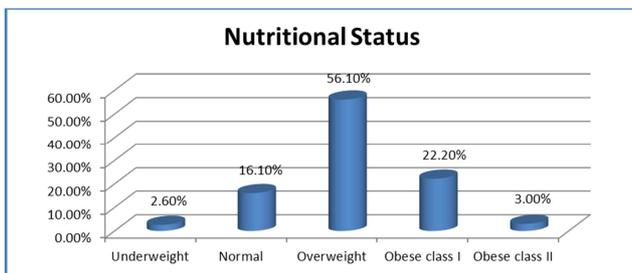


Figure 2. Percentage distribution of cardiac patients according to nutritional status by Body Mass Index.

Table 3 shows the percentage of respondents with clinical symptoms during treatment. It shows that 87 (37.9%) patients were affected by chest pain; 38 (16.5%) affected by weakness; 29 (12.6%) affected by sweating; 34 (14.7%) affected by nausea; 85 (37%) affected by rapid heart bit; 14 (6.0%) affected by shortness of breath; 10 (4.3%) affected by muscle pain; 8 (3.44%) affected by discomfort in jaw, neck. It seems that most of the respondents were affected by chest pain and rapid heart bit.

Table 3. Frequency and percentage distribution of respondents according to their clinical symptoms.

Clinical symptoms of CVD patient's	Frequency	Percentage
Chest pain	87	37.9%
Weakness	38	16.5%
Sweating	29	12.6%
Nausea	34	14.7%
Rapid Herat bit	85	37%
Shortness of breath	14	6.0%
Muscle pain	10	4.3%
Discomfort in jaw, neck	8	3.44%

Table 4 shows that 31.7% male and 23.5% female consumed egg yolk; 27.8% male and 17.0% female did not consume egg yolk. Again, 33.5% male and 27.4% female consumed red meat; 26.1% male and 13.0% female did not consume red meat. It also shows that 44.8% male and 27.4% female consumed fried food; 14.8% male and 13.0% female did not consume fried food. Again, 35.2% male and 28.7% female consumed extra salt; 24.3% male

and 11.7% female did not consume extra salt. It also shows that 28.3% male and 23.5% female consumed coconut milk; 31.3% male and 17.0% female did not consume coconut milk. It seems that fried food consumption and extra salt intake were more common in male patients than female.

Table 4. Percentage distribution of male and female respondents according to their dietary habit.

Variable	Response	Gender		Total
		Male	Female	
Egg yolk consumption	Yes	31.7%	23.5%	55.2%
Egg yolk consumption	No	27.8%	17.0%	44.8%
Red meat consumption	Yes	33.5%	27.4%	60.9%
Red meat consumption	No	26.1%	13.0%	39.1%
Fried food consumption	Yes	44.8%	27.4%	72.2%
Fried food consumption	No	14.8%	13.0%	27.8%
Extra salt intake	Yes	35.2%	28.7%	63.9%
Extra salt intake	No	24.3%	11.7%	36.1%
Coconut milk consumption	Yes	28.3%	23.5%	51.7%
Coconut milk consumption	No	31.3%	17.0%	48.3%

Table 5 shows the consumption level of 16 food groups among respondents. It shows that 63 (27.4%) respondents consumed 16 food groups at poor level and 100 (43.5%) respondents consumed 16 food groups at adequate level. It also shows that 67 (29.1%) respondents consumed 16 food groups at adequate high level. It is found that adequate consumption level was high among respondents.

Table 5. Percentage distribution of respondents according to the consumption level (among sixteen food groups).

Consumption level of 16 food group	Frequency	Percentage
Poor Consumption (<5 food items)	63	27.4%
Adequate consumption (5-8 food items)	100	43.5%
Adequate high (>8 food items)	67	29.1%
Total	230	100.0%

Table 6 shows percentage of respondents who reportedly consumed foods from the listed food groups during the day preceding the recall. It shows that 30.4% male and 14.3% female consumed dark green vegetable regularly and 29.1% male and 26.1% female consumed dark green vegetable irregularly. It shows that 54.8% male and 37.4% female consumed other vegetable regularly and 4.8% male and 3.0% female consumed other vegetable irregularly. It also shows that 9.1% male and 5.2% female consumed fruits regularly and 50.4% male and 35.2% female consumed fruits irregularly. It also shows that 33.5% male and 19.1% female consumed fish regularly and 26.1% male and 21.3% female consumed fish irregularly. It shows that 13.5% male and 5.7% female consumed legumes regularly and 46.1% male and 34.8% female consumed legume irregularly. It shows that 11.7% male and 1.7% female consumed milk regularly and 47.8% male and 38.7% female consumed milk irregularly. It also shows that 6.1% male and 3.0% female consumed egg regularly and 53.5% male and 37.4% female consumed egg irregularly.

**Table 6.** Percentage distribution of respondents according to the consumption of various food items during last 30 days.

Food Item	Response	Sex		Total
		Male	Female	
Dark green vegetable	Regularly	30.4%	14.3%	44.8%
	Irregularly	29.1%	26.1%	55.2%
Other vegetable	Regularly	54.8%	37.4%	92.2%
	Irregularly	4.8%	3.0%	7.8%
Fruits	Regularly	9.1%	5.2%	14.3%
	Irregularly	50.4%	35.2%	85.7%
Fish	Regularly	33.5%	19.1%	52.6%
	Irregularly	26.1%	21.3%	47.4%
Legumes	Regularly	13.5%	5.7%	19.1%
	Irregularly	46.1%	34.8%	80.9%
Milk	Regularly	11.7%	1.7%	13.5%
	Irregularly	47.8%	38.7%	86.5%
Egg	Regularly	6.1%	3.0%	9.1%
	Irregularly	53.5%	37.4%	90.9%

## 4. Discussion

A strong consumption pattern regularly involves rich fiber, fatty fish, vegetables and fruit food items. Dietary involvements that have focused on improved ingesting of these exact food items have also established cardiovascular risk decrease. The healthy ingestion pattern was negatively linked with cardiovascular disease [2, 3]. Our study also showed that dietary pattern connected with cardiovascular disease. Vegetables, fruits and fatty fish diet are negatively associated with cardiovascular disease. Regular exercise reduces the risk of cardiovascular disease.

## 5. Conclusions

Healthy diet plan can prevent cardiovascular diseases risk. Fruits, vegetables and whole grain negatively associated with cardiovascular disease. Red meat, high fat and fried foods are positively linked with cardiovascular disease.

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