A Study on the High Blood Pressure and Prevalence of Anaemia among KYAU Students and Staffs

*Ahmed Wazedul H. Khan[1], Shakhaowat Hossain[2], Dr. Abdullah Akhtar Ahmed[3]
[1]Teaching Assistant, Department of Pharmacy, Khwaja Yunus Ali University, Bangladesh
[2]Senior Lecturer, Department of Microbiology, Khwaja Yunus Ali University, Bangladesh
[3]Professor, Department of Microbiology, Khwaja Yunus Ali University, Bangladesh
*Corresponding Author: khan.wazed@kyau.edu.bd

ABSTRACT

Obesity, high blood pressure, and anaemia are important factors that affect our health. Now-a-days, the prevalence of these factors among population particularly in young generation of Bangladesh is common. This cross sectional study is an attempt to assess the prevalence of obesity, high blood pressure, and anaemia among the students and staffs of Khwaja Yunus Ali University. The study includes 60 participants on random basis with in the age group 17 to 78 years all of which 51 were males and 9 were females. BMI, Blood pressure, and Hemoglobin were measured for each participant following standard guidelines. Our study reported that 11 males and 2 females were overweight and 5 males suffered from obesity. It is also observed that 9 participants (15%) had high systolic blood pressure among which 5 were from either overweight or obese while 4 participants (6.7%) had high diastolic blood pressure of which 3 participants were from those having high BMI. Our study revealed high prevalence of anaemia, 51 (85%) participants in our study population had some sort of iron deficiency. All female participants (100%) were observed to have moderate to severe anaemia. The study also showed that 11 participants who had overweight also possessed severe or mild anaemia. From our study, we observed that there is a strong correlation in age, sex, BMI, and blood pressure. Various socio-demographic features like age, sex, economic status, food habits and infections are the etiological factors for nutritional iron deficiency. Further research with comparatively a large sample volume is required to draw out the exact proportion for prevalence of anaemia so that appropriate remedial initiatives can be taken.
Key Words: Anaemia, Body Mass Index (BMI), Blood pressure (BP).

INTRODUCTION:

In recent years, it is most alarming issue to have hypertension and anaemia among all ages of people in the case of both male and female. Hypertension has already affected one billion people worldwide, leading to heart attacks and strokes. Researchers have estimated that, raised blood pressure currently kills nine million people every year [1]. Globally cardiovascular disease accounts for approximately 17 million deaths a year, and among them, hypertension accounts for 9.4 million death. Hypertension is responsible for at least 45% of deaths due to heart disease and 51% of deaths due stroke [2].

Anaemia which is the most problematic health issue around the world, occurs due to inadequate number of hemoglobin in red blood cells when it fails to meet the body's physiologic needs according to its own demand. Specific physiological needs can be different from person to person due to variation in different factors like age, gender, residential elevation above sea level (altitude), smoking behavior, and different stages of pregnancy. It is thought that, one of the major causes of anaemia is due to deficiency of iron globally, but other nutritional deficiencies (including folate, vitamin B12 and vitamin A), acute and

chronic inflammation, parasitic infections, and inherited or acquired disorders that affect hemoglobin synthesis, red blood cell production or red blood cell survival are also responsible for anaemia [3].

According to WHO database of 1993-2005, the global prevalence of Anaemia was 24.8% (95% CI=22.9–26.7) and 1620 million (95% CI=1500–1740) were affected in Anaemia. The proportion of the population was high for preschool-age children (76.1%) and pregnant (69.0%) and non-pregnant women (73.5%), but lower for school-age children (33.0%), men (40.2%), and the elderly (39.1%)[4]. According to report of Bangladesh Bureau of Statistics in 2003, the prevalence of Anaemia is severe in preschool-aged children (49%) and pregnant women (46%) throughout Bangladesh, and in adolescents in the CHT (43%)[5].However, body height and weight measurement provides information about the nutritional and health status of the body. There is a sharp relationship of hypertension and anaemia with body mass index. It is also mentionable that both hypertension and anaemia are responsible for consumption of inadequate nutrition[6].

The study was conducted to get a clear scenario of present situation of the prevalence of high blood pressure and anaemia among the students and staffs of different ages at Khwaja Yunus Ali University. To our knowledge, this is the first study of this type at Khwaja Yunus Ali University.

METHODS AND METHODOLOGY:
This study is a cross-sectional study which was conducted in the month of September, 2015 at the premises of Khwaja Yunus Ali University.

Study subjects: Both residents or non-residents students and staffs of the university were subjected to this study. Before starting the study, a written consent was taken from each participant. For ethical consideration, approval was taken from the Ethical Review Committee (ERC) of the University.

Data collection: Three teams were involved for this study purpose (a) BMI measuring team (b) Blood pressure measuring team (c) Hemoglobin analyzing team. All teams were supervised by the teachers of the department of pharmacy including medical professional and lab technicians. Data collection and experiment were performed by the students of the Department of Pharmacy for which they received training by professional expert before conducting the study.

Measurement of BMI: Anthropometry measurement for weight and height was recorded in nearest kilogram and centimeter unit. The measurement was taken wearing light cloths and without shoes. A height rod attached with the modern weight machine is used to measure the body weight and height. Body mass index (BMI) was calculated as weight in kg divided by the square of height in meter for every individual and recorded for analysis [7]. According to WHO standard of BMI, participants are classified as underweight (BMI below 18.5), Normal (BMI 18.5-24.99) and Overweight (BMI25-29.99) and Obese (BMI above 30[8].

Blood pressure measurement: The pressure was measured on the right arm using normal cuffs for adults fitted with a standard mercury sphygmomanometer, placing the stethoscope bell lightly over the pulsatile brachial artery. Pressure was usually recorded to the nearest 2 mm Hg from the top of the mercury meniscus. Systolic pressure was recorded at the first appearance of sounds, and diastolic pressure was measured at phase V, disappearance of sounds. To reduce the variation of BP, the

participants were ensured to rest and relaxation at least 10 minutes in sitting position before BP was record.

Measuring & analyzing of hemoglobin: By using Sahli's hemoglobinometer, hemoglobin concentrations were determined and analyzed calorimetrically. Blood samples were drawn by Sahli's pipette and then added to the haemoglobin tube where haemoglobin (Hb) was converted to acid haematin by the addition of 0.1 N Hydrochloric acid, and the resulting brown colour was diluted by adding disilled water, which was finally compared with the standard brown glass reference blocks of Sahli's haemoglobinometer.

RESULT & DISCUSSION:
A total of 60 participants including 24 staffs and 36 students of various departments in the Khwaja Yunus Ali University were selected randomly. Among them, 51 (85%) were male and 9 (15%) were female.

The study populations were categorized into five age groups, under 21 years, 21-25 years, 26-30 years, 31-35 years and above 35 years (Figure 1). The highest number of participants was (24) under 21 years of age which is followed by 18 participants with age range 21-25 years and 9 participants with ages above 35 years (Figure 1). For all the age groups, male participants were higher than female participants.
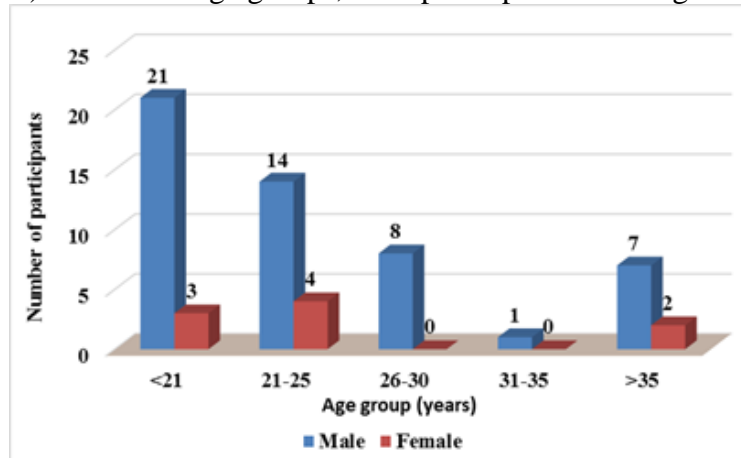

Figure 1: Distribution of participants in different age group and sex

The highest number of participants (35) had BMI 18.5-24.9 and considered to be healthy weight (Figure 2). Among the participants, 11 males and 2 females were overweight and 5 males were observed to be obese with BMI greater than 29.9.
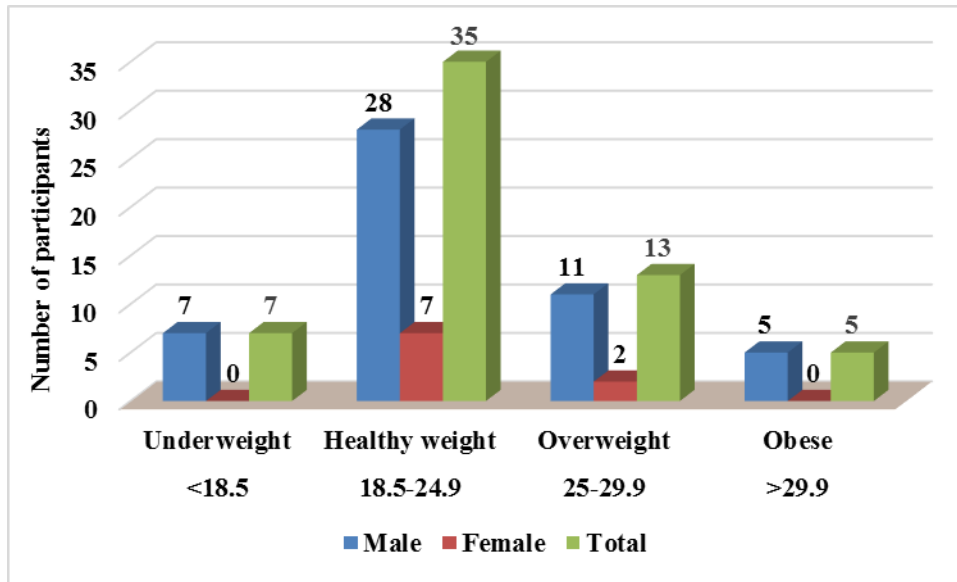
Figure 2: Distribution of participants according to BMI and respective consideration in sexes

Table 1 and 2 show the distribution of systolic and diastolic BP according to various age groups. It is observed that highest number of participants of all age groups have normal systolic and diastolic blood pressure with the frequency of 51 & 56 respectively. Two participants, one from under 21 years and another from above 35 years have high systolic blood pressure, 140-159 mmHg, whereas four participants, one from age range 21-25 years and the others three from over 35 years, were found to be high diastolic BP (90-99 mmHg). The results comply with the other study of similar type[9].

Table-1: Distribution of systolic blood pressure with ages.

Age in years	Level in mmHg				Total
	<120	120-139	140-159	>159	
<21	21	2	1	0	24
21-25	17	1	0	0	18
26-30	7	1	0	0	8
31-35	1	0	0	0	1
>35	5	3	1	0	9
Total	51	7	2	0	60

Table-2: Distribution of diastolic blood pressure with ages

Age in years	Level in mmHg				Total
	<80	80-89	90-99	>99	
<21	24	0	0	0	24
21-25	17	0	1	0	18
26-30	8	0	0	0	8
31-35	1	0	0	0	1
>35	6	0	3	0	9
Total	56	0	4	0	60

Table 3 and 4 show the distribution of systolic and diastolic BP according to its BMI. It is observed that BP according its BMI is quite normal, highest number of participants with normal BMI have normal systolic and diastolic blood pressure with a frequency 31 & 35 respectively. Five participants who were overweight or obese also have elevated systolic BP (Table 3) and three participants having BMI 25 or higher were found to be high diastolic BP (Table 4). It indicates that there is a correlation between BMI and BP. This is supported by other study [9].

Table-3: The distribution of systolic blood pressure with body mass index

Body Mass Index		Level in mmHg				
		<120	120-139	140-159	>159	Total
Underweight	<18.5	7	0	0	0	7
Normal	18.5-24.9	31	3	1	0	35
Overweight	25-29.9	11	2	0	0	13
Obese	>29.9	2	2	1	00	5
Total		51	7	2	0	60

Table-4: The distribution of diastolic blood pressure with body mass index

Body Mass Index		Level in mmHg				
		<80	80-89	90-99	>99	Total
Underweight	<18.5	6	0	1	0	7
Normal	18.5-24.9	35	0	0	0	35
Overweight	25-29.9	12	0	1	0	13
Obese	>29.9	3	0	2	0	5
Total		56	0	4	0	60

Figure 3 and 4 exhibit the frequency and percentage of participants with hypertension risk according to systolic and diastolic BP. It is observed that 11.7 % of participants had prehypertension stage followed by 3.3% of participants were in hypertension stage-1.
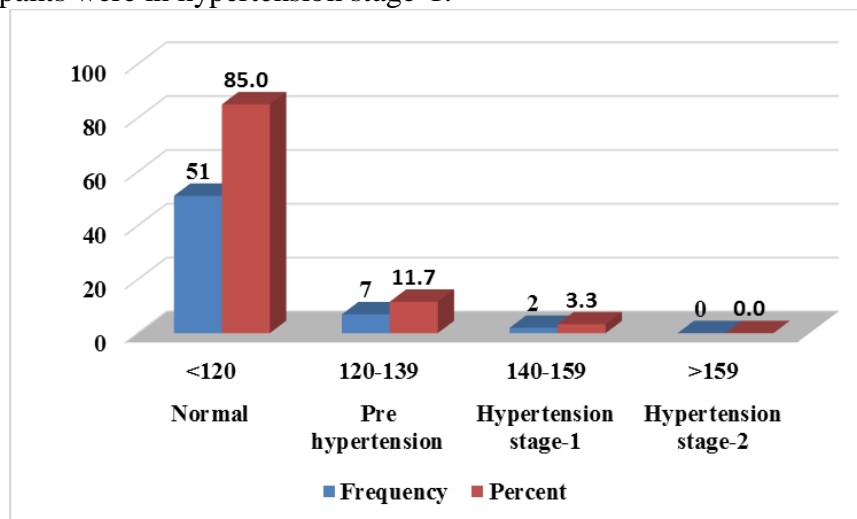

Figure 3: Distribution of participants according to diastolic BP and respective consideration:
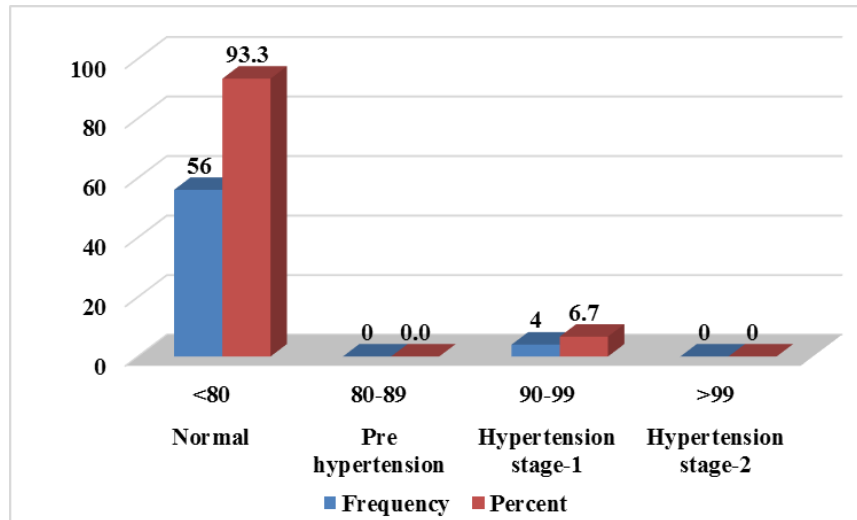
Figure 4: Distribution of participants according to diastolic BP and respective consideration

Figure- 5 shows the prevalence of anaemia among the participants according to the sex. Most of the participants (51) were observed to have anaemia. Among them 17 (13 male & 4 female) had hemoglobin level below 8.0 g/ dL and considered to be severe anaemic whereas 25 had mild anaemia 9 had moderate level. Only 9 participants were found to have hemoglobin level above 12.9 g/ dL and considered to be free from anaemia. Similar studies on anaemia prevalence from different states of rural India reported high prevalence of anaemia. A study carried out among 265 adolescent girls of Amritsar in 2005 by Sharda Sindu also discovered high prevalence (70-75%) of anaemia including 12.83% girls who had severe anaemia. A study by Passi & Malhotra (2002) found that with the onset of menarche at puberty & in the absence of adequate dietary intake, young girls become highly susceptible to anaemia.
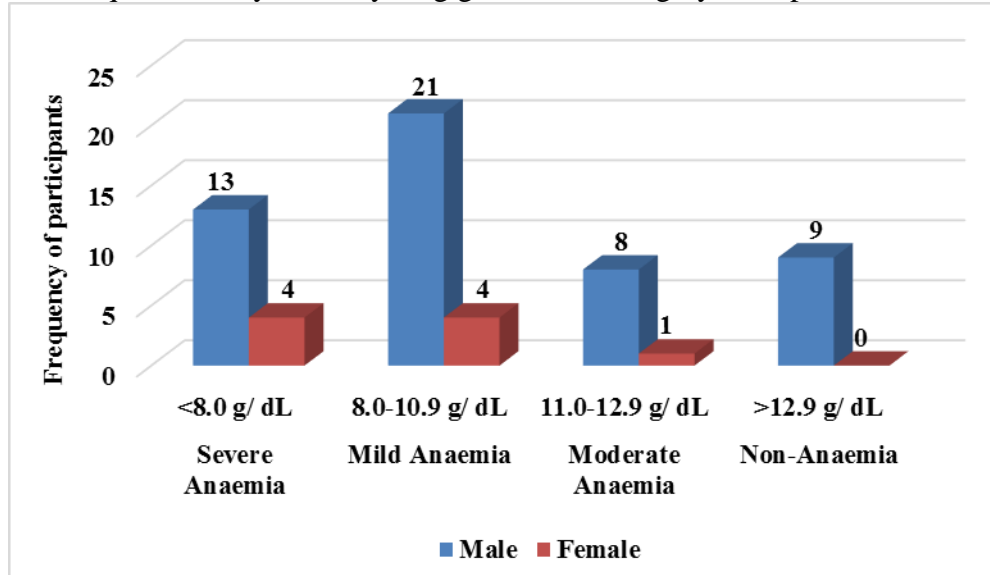

Figure 5: Correlation of anaemia with sex

Figure-6 shows the prevalence of anaemia according to BMI. Twenty-five participants with normal BMI possessed severe or mild anaemia while 11 participants having overweight according to their BMI also possessed severe or mild anaemia.
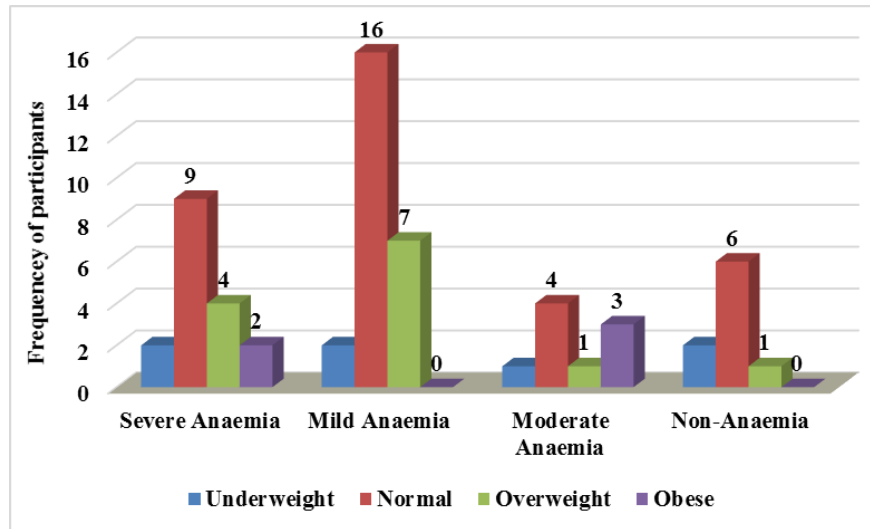
Figure 6: Correlation of anaemia with BMI of participants

CONCLUSION:

The study found a significant case of overweight/ obesity among university students and staffs. Several ages, sex, economic condition and lifestyle specific health risk practices were identified that can be utilized in health promotion programs. Students should avoid sedentary lifestyle and engage themselves more in sports and physical activities parallel to their regular academic parts. The university administration needs to promote healthy life styles as proposed by the WHO Global Strategy on Diet, Physical Activity and Health.

The study also found a high prevalence of nutritional anaemia among the participants especially students. Iron deficiency anaemia is predominant among a vast number of population, especially rural women and children in Bangladesh. In majority of the cases, it occurs due to the lack of iron-rich food in daily diet and, sometimes causes like excess menstrual blood loss, poor diet and under nutrition for women. Our observation is that besides the rural women and people with lower economic status, the majority of university students, especially female, are affected by iron deficiency anaemia. The possible reason might be their food habit which provides inadequate amount of iron and their lifestyle that always keeps them under academic stress. Irregular intake of breakfast and iron supplement may be another reason behind this. Although most of the study participants are university students, it is unlikely that majority of them are not aware about anaemia. Nutritional anaemia is easily preventable and can be controlled affordably. The students should be motivated and educated to consume balanced diet rich in iron. Frequent screening of students for presence of anaemia should be done. Iron supplementation might be required for the target group suffering severe anaemia and a special campaign conducted by the university administration is advisable.

REFERENCES:
1. A global brief on hypertension; silent killer, global public health crisis; World Health Day 2013; World Health Organization.
2. Causes of death 2008 [online database] Geneva, World Health organization.
3. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity; World Health organization; WHO/NMH/NHD/MNM/11.1; 2011
4. Bruno de Benoist, Erin McLean, Ines Egli, Mary Cogswell; Worldwide prevalence of Anaemia 1993-2005; WHO Global database on Anaemia; World Health Organization.

5. A Report on Anaemia Prevalence Survey of Urban Bangladesh and Rural Chittagong Hill Tracts 2003; Bangladesh Bureau of Statistics and UNICEF; May 2004.

6. Alireza Moafi et al "A Study on Body Mass Index, Blood Pressure, and Red Blood Cell Indices in New Entering Students of the University of Isfahan" International journal of preventive medicine. Int J Prev Med 2011; 2(4): 280-285.

7. Centers for Disease Control and Prevention. About BMI for children and teens. Atlanta, GA: Centers for Disease Control and Prevention,(http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html, accessed on 7 February 2013).

8. Kamal Mehta; Prevalence of Nutritional Anaemia among College Students and its Correlation with their Body Mass Index; International Journal of Science and Research (IJSR); Volume 4 Issue 3, March 2015.

9. Abdul-Hussein F. Ghadhban, Omran S Habib "A STUDY ON THE DISTRIBUTION OF BLOOD PRESSURE MEASUREMENTS AMONG UNIVERSITY STUDENTS" The Medical Journal of Basrah Universiy, Volume-29, No-1&2, 2011