



## Prevalence of Diabetes and Hypertension in Youngfemales of Lahore College for Women University, Lahore

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**ABSTRACT:** *Diabetes and hypertension are non-communicable diseases. Diabetes is a significant cause of early death and debility globally. The objective of the present study is to find out the percentage incidence of diabetes and hypertension in young females of Lahore College for Women University Jail Road, Lahore. This cross-sectional study was conducted, January 2017 to June 2017. It was included 200 subjects. The average age of the population under study was  $20 \pm 0.17$  years. About 4.5% (n=9) of the population was pre-diabetic and all were obese. While, 36% (n=73) of population was suffering from prehypertension and 5% (n=10) with hypertension. Among a total of 83 subjects with elevated systolic blood pressure (SBP), 41 were overweight and obese. According to diastolic blood pressure (DBP) 7% (n=14) of the population was suffering from pre-hypertension and 6% (n=12) with hypertension. 26 subjects had elevated diastolic blood pressure and among these, 20 subjects were overweight and obese. The whole population is divided among 4 groups according to the age groups. Body mass index was more prevalent in the age group 25-27 years. It is stated that overweight and obesity are strongly associated with diabetes and hypertension. It was concluded that increased BMI was the main predictor of diabetes and hypertension. However no diabetic patient were found in population and the prevalence of pre-diabetic subjects were 4.5 % and according to SBP and DBP 5% and 6 % of the population were hypertensive.*

**Keyword:** *hypertension, diabetes, pre-diabetes, prehypertension, women's health*

### INTRODUCTION

Diabetes mellitus is a metabolic disorder. It is a bunch of illnesses

characterized by an unusual carbohydrate digestion system that leads to hyperglycemia. It is related to a comparative or supreme lack of insulin

secretion or resistance to the activity of insulin (Ogedengbe, 2009). In 2012 there were 1.5 million people around the world specifically effected by diabetes. It was the eighth driving cause of passing among both genders and the fifth driving cause of passing in ladies in 2012 (WHO, 2016)

Much of this increase will happen in developing nations and will result from populace age, unhealthy food intake, weight gain and inactive life style. The prevalence of diabetes, comprised primarily by type 2 diabetes (T2D), is a global public health danger. The prevalence among grown-ups matured 20-70 years is relied to rise from 285 million in 2010 to 438 million by the year 2030. The prevalence of diabetes is increasing in Asian countries as Asian countries contribute to more than 60% of the world's diabetic population (Ramachandran et al., 2012).

Type1 diabetes accounts for as it were 5-10% of all diabetes cases. Its frequency proceeds to extend around the world. Type 2 diabetes, termed as non-insulin-dependent diabetes mellitus or adult-onset diabetes, may account for around 90% of all analyzed cases of the infection. Impaired glucose tolerance (IGT) and impaired fasting glycemia (IFG) are middle conditions within the move between ordinary blood glucose

level and diabetes (particularly type 2), even though the move isn't unavoidable. Individuals with IGT or IFG are at expanded hazard of heart assault and strokes (Shaw et al., 2010). Gestational diabetes (GDM) may be a short-lived condition that happens in pregnancy and carries the long-term hazard of type 2 diabetes (Bellamy et al., 2009).

Type 1 is caused by the interaction between hereditary material and environmental factors. Mostly occurs in children and young people. The chance of type 2 diabetes is decided by a transaction of hereditary and metabolic variables. Ethnicity, family history of diabetes, and past gestational diabetes combine with more seasoned age, physical dormancy, undesirable count calories, obesity and smoking to extend risk. Overweight and corpulence, at the side of physical dormancy, are evaluated to cause a huge extent of the worldwide diabetes burden (Forouzanfar et al., 2015). Chance variables and chance markers for GDM incorporate age, overweight or obesity; over the top weight pick up amid pregnancy and family history of diabetes (Anna et al., 2005).

1.9% of direct or extreme visual impedance universally and 2.6% of visual deficiency in 2010 is caused by diabetic retinopathy (Bourne et al.,

2013). Considers propose that predominance of any retinopathy in people with diabetes is 35% where as proliferative (vision-threatening) retinopathy is 7%. Be that as it may, retinopathy rates are higher among: individuals with type 1 diabetes; individuals with a longer length of diabetes; Caucasian populaces; and conceivably among individuals of lower socioeconomic status. (Yau et al., 2013). Grown-ups with diabetes verifiably have a two or three times higher rate of cardiovascular disease (CVD) than grown-ups without diabetes. Diabetes shows up to drastically increment the chance of lower extremity amputation. Hypertension, also known as high blood pressure, is a long term medical condition in which the blood pressure in the arteries is persistently elevated.

There are approximately 1.5 billion individuals with raised BP all inclusive. It is evaluated to cause 7.1 million passing within the world (13% of the overall) each year and approximately 4.4% of the worldwide illness burden. Within the Joined together States, each year hypertension accounts for 35% of all myocardial areas of dead tissue and strokes, 49% of all heart disappointment and 24% of all untimely deaths. Hypertension, being a silent disease, often goes undiagnosed leading to

serious complications which include strokes, heart attacks/heart failure, visual loss and kidney failure (Forouzanfar et al., 2016).

Diabetes is multifactorial disease and hypertension is itself a leading cause of a lot of cardiovascular disease. It's an important study and the main objective of the study is to find out the percentage incidence of diabetes and hypertension in young females of Lahore College for Women University Jail Road, Lahore.

## **MATERIALS AND METHODS**

The design of the study was cross-section, January 2017 to June 2017, at Lahore College for Women University Jail Road, Lahore. 200 subjects were included in this survey. The study was approved from the ethical committee of Zoology Department of Lahore College of Woman University, Lahore. Their Demographic data, socioeconomic status, family history of diabetes and hypertension and lifestyle were recorded through a comprehensively designed questionnaire.

Standing height was measured using the height measuring tape in the feet. With the participant's feet put at the side heels, buttocks and shoulder blades against the adhere and head situated within the Frankfurt even plane. Height is initially measured in

centimeters then converted into meters. Weight was measured by using Weighing Scale with a subject standing erect without shoes. Glucometer was used to measure the blood sugar level. The blood sugar levels were recorded randomly. The standard method of measuring blood pressure is the indirect method called the auscultatory method. After measuring height and weight, BMI ( $\text{kg}/\text{m}^2$ ) was calculated by using a formula for BMI ( $\text{kg}/\text{m}^2$ ).

Formula used for calculating BMI ( $\text{kg}/\text{m}^2$ ) was:

$$\text{BMI kg/m}^2 = \frac{\text{Weight in kilograms}}{\text{Height in meter}^2}$$

### Statistical Analysis

Data were analysed statistically and were presented in the form of graphs, charts and tables. Microsoft Office Excel 2013 was used for statistical analysis. Mean values of parameters were calculated and expressed as  $\pm$  SEM. Analysis of variance (ANOVA) was used to evaluate differences in anthropometric variable means according to blood sugar level.  $p$ -value was considered significant at 0.05 or less. A computer program SPSS 16.0 was used for the analysis of *Pearson's* correlation between blood sugar level and blood pressure and body mass index (BMI).

### RESULTS

In studied population the mean age was  $20.41 \pm 0.17$  years. The demographic data was presented in Table 1.

The total population was divided into 4 groups based on age. Group 1 has subjects of age range 16-18 years. The age range of group 2 was 19-21 years, the age range of group 3 was 22-24 years and the age range of group 4 was 25-27 years. The average values of age, height, weight, systolic blood pressure, diastolic blood pressure, sugar level and BMI were calculated in all age groups. BMI was more prevalent in the age group 25-27 years. One-way ANOVA was applied revealed significant difference of BMI but in systolic blood pressure, diastolic blood pressure and sugar level groups' difference was non-significant.

In the study particularly those subjects were included who had a fasting of about 10-16 hours when their blood glucose level was examined. It was observed that out of 200 females, 9 were pre-diabetic and 191 were normal. There was no diabetic subject in the studied population.

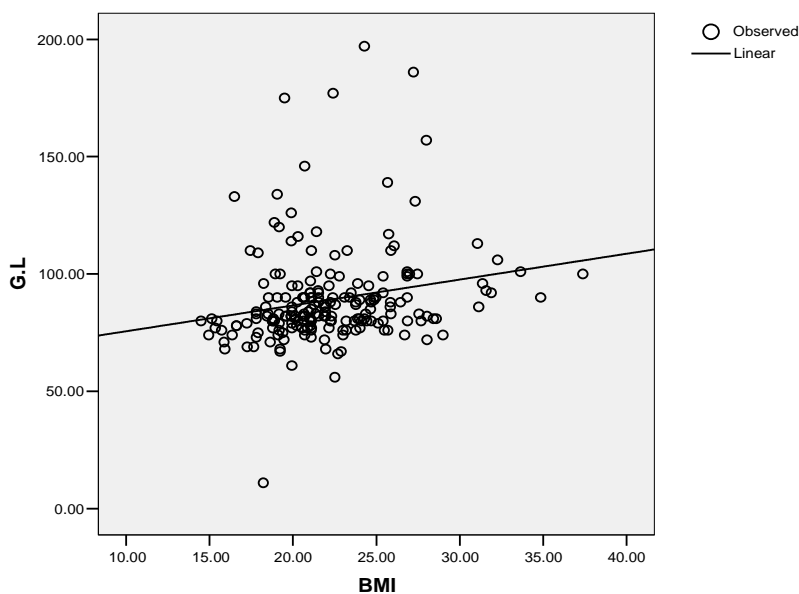
The arterial blood pressure was divided into two sub-groups. The systolic and diastolic blood pressure of the population was separated. According

to systolic blood pressure, 36% (n=73) of the population was suffering from pre-hypertension and 5% (n=10) with hypertension. According to diastolic blood pressure, 7% (n=14) of the population was suffering from pre-hypertension and 6% (12) with hypertension. 43.5% (n=87) of population under study was suffering from pre-hypertension state and 11% (n=26) with hypertension.

According to the Asian criteria, 13% (n=26) of studied population was underweight, 51% (n=103) normal, 15% (n=15) overweight, and 16% (n=16) obese. 4% (n=8) population belonged to

obese class I and only 1% (n=1) to obese class II. There were 9 pre-diabetes in this study and all were obese. The number of subjects who had elevated systolic blood pressure was 83. Among 83 subjects 41 were overweight and obese. 20 subjects out of 26 were overweight and obese whose diastolic blood pressures were elevated.

To determine the impact of BMI on blood sugar level the correlation analysis was done which revealed that blood sugar level was correlated with BMI ( $r = 0.204$ ) whereas the correlation of blood pressure with BMI is non-significant. (Fig. 1)



**Fig. 1. Correlation between BMI (Kg/m<sup>2</sup>) and Glycemic level (g/dL).**

**Table 1: Demographic Data of Studied Population**

Sr. No.	Variables	Mean ± S.E.M
1	Age	20.41 ± .17
2	Height (cm)	159.9 ± .5
3	Weight (kg)	56 ± .6
4	BMI (kg/m <sup>2</sup> )	22.17 ± .27
5	Systolic blood pressure (mm/Hg)	119.4 ± .17
6	Diastolic blood pressure (mm/Hg)	79.45 ± .35
7	Sugar level (g/dL)	89.01 ± 1.5

## DISCUSSION

Type 2 diabetes is getting to be a progressively predominant clutter among youthful people who are driven, as is the case in grown-ups, by way of life variables driving to expanded body weight. Hereditary and familial components, fetal natural variables, especially maternal gestational diabetes and intrauterine development hindrance, and the need for physical action amid childhood and puberty lead to expanding levels of insulin resistance that show up to be vital within the pathogenesis of type 2 diabetes within the youthful. The disorder is associated with microvascular malady, with a proposal of a more prominent risk of nephropathy than of retinopathy, and may too lead to early macrovascular infection (Basit et al., 2015). There could be a great affiliation between hypertension state and obesity. The entire pre-hypertensive subjects

agreeing to systolic blood weight were 73 (36%). The number of subjects enduring hypertension was 10 (5%). The whole pre-hypertensive subjects concurring to diastolic blood pressure were 14 (7%) and 12 (6%) subjects with hypertensive conditions as the prevalence rate of hypertension in Pakistan is 26.34% (Shah et al.,2018). Age is a risk for of hypertension and it is observed not only aged person are suffered from this but also the adult people aged 25 and above suffer from hypertension. In1967, a prospective analysis of data from the Framingham Heart Study highlighted that there is a relationship between obesity and hypertension and 78% of incident hypertension in men and 64% of incident hypertension in women was seen among the patients with obesity (>60%) (Bramlage et al., 2004). The prevalence of hypertension increased in relation to BMI in both men and women

after adjusting for age (Shihab et al., 2012). Estimates indicate that the increased risk of developing hypertension is 20–30% for every 5% increment in weight gain (Droyvold et al., 2005). This showed that hypertension is related to the obesity as it's a prominent risk factor for the development of hypertension. Treatment for hypertension is present but it has some side effects. Therefore, the proper guidelines are necessary which includes deep lifestyle modifications aiming to reduce body weight, thereby consuming a low-caloric diet with a total of 500–1,500 or 500-1,200 calories for men or women, respectively. It also include the restriction of salt intake and lower intake of saturated fats and cholesterol with increased consumption of water, fruits, fresh and raw vegetables, fish, lean meats and constant physical activity as well as adequate night sleep (Jiang et al., 2016),

## **CONCLUSION**

The prevalence percentage of pre-diabetes in this study is 4.5% (n=9). 41.5% (n=83) of the total population had elevated systolic blood pressure and the prevalence percentage of diastolic blood pressure was 13% (n=26). Physical activity and daily exercise show an inverse relationship with diabetes, blood pressure and BMI. It can

be concluded that with an increasing body mass index there is an obvious increase in high sugar levels and blood pressure in university students.

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