

**Association of Diabetes Mellitus Risk Factors in an Urban Resettlement Colony, District Gautam Budh Nagar, Uttar Pradesh**Vivek Gupta<sup>1</sup>, Harsh Mahajan<sup>2</sup>, Shalini Srivastav<sup>3</sup><sup>1</sup>Assistant Professor, Department of Community Medicine, FH Medical College, Agra, U.P. India<sup>2</sup>Professor, Department of Community Medicine, School of Medical Sciences & Research, Sharda University, Greater Noida, U.P. India<sup>3</sup>Professor & Head, Department of Community Medicine, School of Medical Sciences & Research, Sharda University, Greater Noida, U.P. India

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Conflict of interest: Nil

**Abstract:**

**Introduction:** Non-communicable diseases (NCDs) are one of the major health and development challenges of the 21st century, in terms of both the human suffering they cause and the harm they inflict on the socioeconomic fabric of countries, particularly low- and middle-income countries. No government can afford to ignore the rising burden of NCDs. In the absence of evidence-based actions, the human, social and economic costs of NCDs will continue to grow and overwhelm the capacity of countries to address them.

**Objectives:** 1. To assess the prevalence of diabetes mellitus in slum dwellings of urban field practice area of SMS&R, Gautam Buddh Nagar. 2. To study the prevalence of risk factors of diabetes mellitus in the study population. 3. To make recommendations for prevention of Type-II Diabetes Mellitus based on finding of the present study.

**Methodology:** The study design was Community Based Cross sectional study from January 2017 - January 2018. The study was planned and conducted among urban field practice area of SMS&R covering 6 colonies namely Jeetram, Goel, kunda bhatta, Rajeev, salarpur.

**Result:** In present study significantly higher prevalence of Diabetes (23.8%) was found in those consuming <5 serving of Fruit and vegetables in Diet, similar pattern seen in IFG glucose also (57.3%) The prevalence of diabetes mellitus and impaired fasting glucose was higher (30.8%, 69.2% respectively) in those who had family history of diabetes mellitus and this association was not statistically not significant.

**Conclusion:** Overall prevalence of Diabetes Mellitus was found 21.7%. Prevalence of Diabetes Mellitus males (22.8%) was slightly higher than females (20.5%). This difference is however not statistically significant. The prevalence of Diabetes Mellitus showed a significant correlation with family income. Prevalence of Diabetes Mellitus was found significantly higher among unemployed / unskilled subjects (26.4% and 24.7% respectively) as compared to professionals (15.1%).

**Keywords:** Diabetes Mellitus, NCD, Fruits & Vegetables, Family History.

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**Introduction**

Non-communicable diseases (NCDs) are one of the major health and development challenges of the 21st century, in terms of both the human suffering they cause and the harm they inflict on the socioeconomic fabric of countries, particularly low- and middle-income countries. No government can afford to ignore the rising burden of NCDs. In the absence of evidence-based actions, the human, social and economic costs of NCDs will continue to grow and overwhelm the capacity of countries to address them [1]. Diabetes is one of the four priority non-communicable diseases (NCDs) identified by the WHO along with cardiovascular disease (CVD), which includes

heart attack and stroke, cancer, and chronic respiratory disease. In 2012, the age-standardized NCD death rate was 539 per 100 000 population globally. The rate was lowest in high-income countries (397 per 100 000) and highest in low-income countries (625 per 100 000) and lower-middle-income countries (673 per 100 000) [2]. Regionally, age-standardized death rates for NCDs ranged from 438 per 100 000 in the WHO Region of the Americas to over 650 per 100 000 in the WHO African, South-East Asia and Eastern Mediterranean Regions. Cardiovascular diseases were responsible for the largest proportion of NCD deaths under the age of 70 years (37%), followed

by cancers (27%), and chronic respiratory diseases (8%). Diabetes was responsible for 4% and other NCDs were responsible for approximately 24% of NCD deaths under the age of 70 years [3]. India contributes 61% of death from NCDs and there is 23 % risk of premature death from target NCDs [4].

#### Materials and Methods:

**Design:** The study design was Community Based Cross sectional study from January 2017 - January 2018. The study was planned and conducted among urban field practice area of SMS&R covering 6 colonies namely Jeetram, Goel, kunda bhatta, Rajeev, salarpur.

**Study Population:** The study was carried out in bhangel which has total population of 10800 and is urban field practice area of SMS&R covering 6 colonies namely Jeetram, Goel, Kunda Bhatta, Rajeev, Solapur. People aged 18 year and above living in the study area were eligible to participate in the study.

**Data Collection:** Household having >18yr individuals were selected through family's database of the

UHTC SMS&R. Head of the house was contacted for consent and identification of the subject.

One person was identified randomly. In depth interview of the study subject was carried out through pretested questionnaire. Whole sampling unit was screened for fasting blood glucose blood glucose through glucometer.

**Statistical Analysis:** Data analysis was carried out utilizing IBM SPSS (Statistical Package for Social Sciences developed by International Business Machines). 20.0 version and MD Excel sheet.

Data was analyzed by using statically method (mean, standard deviation for quantitative data and proportion, X2 test. For all the tests P value <0.05 is considered as statically significant.

**Ethics Consideration:** The study received Ethical approval from the Institute Ethics Committee of Sharda University, Greater Noida.

#### Result:

**Table 1: Association of Diabetes in study participants with Hypertension**

Blood pressure in study subjects	Diabetes N=76 (%)	IFG N=177(%)	Normal N=97(%)	Total	$\chi^2$ Value	P-value
Normal	17(16.8)	51(50.5)	33(32.7)	101	34.555	.000
Pre-hypertension	43(19)	120(53.1)	63(27.9)	226		
Hypertension	16(69.6)	6(26.1)	1(4.3)	23		
Total	76(21.7)	177(50.5)	97(27.7)	350		

In our study prevalence of Hypertension and Pre-Hypertension was found 6.6% and 64.6% respectively in the study subjects. It was also found that 69.6% diabetics were hypertensive and 19% were pre-hypertensive. Among IFG group 26.1% sub-

jects were suffering from hypertension and 53.1% were pre-hypertensive. Hypertension and pre-hypertension were significantly higher (69.6%, 19%, 26.1% and 53.1% respectively) among Diabetes Mellitus and IFG group as compared to normal (4.3% and 27.9% respectively) study subjects.

**Table 2: Gender wise association of Diabetes with hypertension among study participants**

Sex	Blood pressure	Diabetes N=76(%)	Impaired fasting glucose N=177(%)	Normal N=97(%)	$\chi^2$ Value	P-value
Male	Normal	9(17.3)	21(40.4)	22(42.3)	11.99	.017
	Pre-hypertension	27(22.5)	64(53.3)	29(24.2)		
	Hypertension	6(50)	5(41.7)	1(8.3)		
Female	Normal	8(16.3)	30(61.2)	11(22.4)	37.56	.000
	Pre-hypertension	16(15.1)	56(52.8)	34(32.1)		
	Hypertension	10(90.9)	1(9.1)	0(0)		

Table shows prevalence of diabetes among hypertensive female was higher (90.9%) as compared to male (50%) but it was higher in Pre-hypertensive male (22.5%) as compared to pre-hypertensive female and this association was found to be significant in both male and female.

**Table 3: Association of Diabetes in study participants with Body Mass Index**

Body Mass Index	Diabetes N=76(%)	IFG N=177(%)	Normal	Total	$\chi^2$ Value	P-value
Normal (18.5-24.9)	6(11.8)	34(66.7)	11(21.6)	51	17.287	.002
Overweight (25-29.9)	9(10.8)	46(55.4)	28(33.7)	83		
Obesity (>30)	61(28.2)	97(44.9)	58(26.9)	216		
Total	76(21.7)	177(50.5)	97(27.7)	350		

Of the 76(21.7%) diabetics, significant association found between Diabetes and BMI of study subjects, it shown higher prevalence of Diabetes seen in those individuals who were obese. In our study Mean BMI of study subjects was found to be 31.12( $\pm$ 6.1). It is further observed irrespective of the guidelines adopted; the prevalence of Diabetes Mellitus shows a marked difference among those having BMI 30 (28.2%) as compared to those having BMI 25 (10.8%).

**Table 4: Gender wise association of Diabetes mellitus with BMI of study participants**

Gender	Body mass index	Diabetes N=76	Impaired fasting glucose N=177	Normal N=97	$\chi^2$ Value	P-value
Male	Normal (18.5-24.9)	1(7.1)	12(85.7)	1(7.1)	17.60	.001
	Overweight (25-29.9)	3(7.1)	25(59.5)	14(33.33)		
	Obesity (>30)	38(29.7)	53(41.4)	37(28.9)		
Female	Normal (18.5-24.9)	5(13.5)	22(59.5)	10(27)	4.48	.344
	(overweight) 25-29.9	6(14.6)	21(51.2)	14(34.1)		
	Obesity (>30)	23(26.1)	44(50)	21(23.9)		

In above table prevalence of diabetes was higher in Obese (male, female 29.7%,26.1% respectively) and overweight individuals as compared to person with normal BMI. Similar pattern was seen in both male and female and among male BMI was significantly associated with diabetes.

**Table 5: Association of Diabetes in study participants with waist circumference**

Gender	Waist circumference	Diabetes N=76(%)	IFG N= 177(%)	Normal N= 97(%)	Total	$\chi^2$ Value	P-
Male	Normal	5(10)	18(39)	23(50)	46	12.83	0.012
	High	38(27.5)	72(52.1)	28(20.2)	138		
Female	Normal	4(9.8)	28(68.3)	9(22)	41	5.94	0.05
	High	29(23.4)	59(47.6)	36(29)	124		

Prevalence of Diabetes Mellitus was significantly higher (27.5%) and 23.4% respectively) among centrally obese male and female study subjects as compared with those having normal Waist Circumference (16% and 9.0% respectively). Similarly the prevalence of IFG was also observed significantly higher (52%) among centrally obese male study objects as compared with those having normal Waist Circumference (39%).

**Limitations of Study:** Firstly, this being a cross-sectional study prevents us from drawing causal inferences. Secondly, measurement of blood glucose was done by a glucometer device instead of venous blood glucose estimation due to logistic constraints.

However, regular quality control check on blood glucose measurement was done in a reference laboratory as per the manufacturer's instructions. Thirdly, only fasting blood glucose was used to diagnose diabetes and pre-diabetes.

**Authors Contribution:** VG had participated in the research study with concept, literature search, and data collection. VG, HM & SS contributed in preparing design, preparing manuscript, editing and reviewing of manuscript.

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