

## Study of determinants of type 2 diabetes related to lifestyle and behavior among urban population of Kalyanpur (Kanpur)

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### Abstract

**Background:** Lifestyle and behavior component in type 2 diabetes is very important. Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world.

**Materials and Method:** The Study was carried out among the people aged 25 years & above residing in field area of UHTC (Urban health training centre- Kalyanpur) of RMCH & RC, Mandhana, Kanpur. UHTC provides health care to 12 Mohallas of ward No.18 & 42 of urban area of Kalyanpur. Out of which 02 Mohallas namely (Jankipuram, Mirzapurnewbasti) were selected for study by simple random sampling method.

**Results:** In the present study out of 460 study participants maximum were from upper class i.e. 134 out of which 46(34%) were found diabetics. There were 460 respondents, 255 have sedentary habit out of which 62(24.3%) were diabetic. Individuals are classified as Sedentary, Moderate, Heavyworker on the basis of occupation Among 113 moderate worker 13(9.5%) were diabetic and among 40 heavy worker 4(10%) were diabetic There were 70(19.8%) diabetic among smoker and 9(8.4%) were diabetic among nonsmoker. Out of total 460 respondents 232were alcoholics and 228 non-alcoholic, 60(25.9%) were found diabetic among alcoholic and 19(8.2%) persons were diabetic among non-alcoholic

**Conclusion:** In the present study, socioeconomic status, nutritional status, smoking, alcohol intake, physical activities are found to be significantly associated with diabetes.

**Keywords:** Type 2 diabetes, Modified B.G Prasad socio economic scale, Self-management.

### Introduction

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries. It is a chronic disease caused by deficiency in production of insulin by pancreas, or decreased effectiveness of insulin produced, resulting in increased concentrations of glucose in blood, damaging body's major organ systems, causing heart attacks, strokes, nerve damage, kidney failure & blindness.

Currently more than 62 million people in India are living with Diabetes. India is now gaining the status of a potential epidemic of diabetes.<sup>(1)</sup> India is largely a rural nation. Since more number of studies are done in urban areas, the prevalence data is mainly available for urban areas and insufficient data is available for rural areas.<sup>(2)</sup> Majority of the population in India reside in the rural areas approximately 742 million. Hence, the estimation of the prevalence of diabetes in rural India becomes crucial from the point of view of designing the strategies to halt the rising prevalence of diabetes.<sup>(3)</sup>

India, the second most populous country of the world, has been severely affected by the global diabetes epidemic. As per the International Diabetes Federation

(2013), approximately 50% of all people with diabetes live in just three countries: China (98.4 million), India (65.1 million) and the USA (24.4 million) India is facing a rapid health transition over the last few decades, increasing the burden of NCD accounting for 53% of deaths. There is clear evidence to show that diabetes prevalence is rapidly increasing, especially in urban India. The conventional risk factors of urbanization, unhealthy eating habits and physical inactivity, coupled with inherent genetic attributes and differences in body composition are propelling the increase in cases of diabetes. Accordingly, diabetes related complications are also on the rise and contribute significantly to overall morbidity and mortality. The low levels of education and poor awareness of the disease in the country are enhancing its impact on health of the population objective of study-To corelate the effect of lifestyle determinants on prevalence of type 2 diabetes mellitus.

### Materials and Method

The study was carried out among the peoples Aged 25 years & above residing in field area of UHTC (Urban health training centre- Kalyanpur) of RMCH & RC, Mandhana, Kanpur. UHTC provides health care to 12 Mohallas of ward No. 18 & 42 of urban area of Kalyanpur. Out of which 02 Mohallas namely (Jankipuram, Mirzapurnewbasti) are selected for study by simple random sampling method.

**Study period:** Study was conducted from Jan 2014 to Dec 2014 for duration of 1 year.

**Study design:** The study was community based cross sectional study.

**Study population:** All the persons aged 25 years and above residing in 02 randomly selected mohallas (Jankipuram, Mirzapur new basti)

**Sample size:** Sample size for present study be calculated as follows as study is a qualitative study – Sample size (n) =  $4PQ/L^2$

Where P = (Prevalence of diabetes among Urban population)

P = prevalence urban 6.1-19.5% (upper limit considered)

Q = 100 – P

L = allowable error (taken as 20% of prevalence) in sample size for present study.

Q = 100-19 = 81

L =  $19 \times 20 / 100$   
 =  $4 \times 19 \times 81 / (3.8) \times (3.8)$   
 = 426

Total population of randomly selected villages (Jankipuram, Mirzapur New basti)

= 1500 + 4500 = 6000

Population of persons aged 25 yrs and above = 6000 - 2820\* = 3180 \*(note- population below 25 yrs was 46.6 (47% of total population 6000 x 47/ 100 = 3180 every fifth house selected by systemic random method. Which were screened 530 eligible respondents for the symptoms out of these 70 excluded under various exclusion criteria's population approximately 10% more than sample size (460) was surveyed in the present study.

**Exclusion Criteria:** Persons who are known diabetic, seriously ill, pregnant women and person who were absent during three successive survey visit and person under taking corticosteroid therapy

1. Pre-designed and pre-tested questionnaire.
2. Clinical assessment of Diabetes Mellitus
3. Random Blood Sugar Check-up (>200mg/dl)

## Results

**Socio-demographic characteristics:** Of the 460 respondents to the survey, 79 (17.2%) who reported type 2 diabetes were included in these analyses. The respondent sample was predominantly male 337 (73.26%), and female 123(26.74%) living in urban regions.

**Socioeconomic status:** In the present study modified B.G.PRASAD classification was adopted for

socioeconomic classification. Out of 460 subjects maximum study subjects were from upper class i.e. 134 out of which 46(34.3%) were found diabetics and minimum study subjects from lower class i.e. 38 out of which 5(13.2%) were found diabetics. It was observed that type2 diabetes was more common amongst those belonging in comparison to lower socio economic class this deference is statistically significant (Chi square= 40.755, p value =.000) [Table 1, Fig. 1]

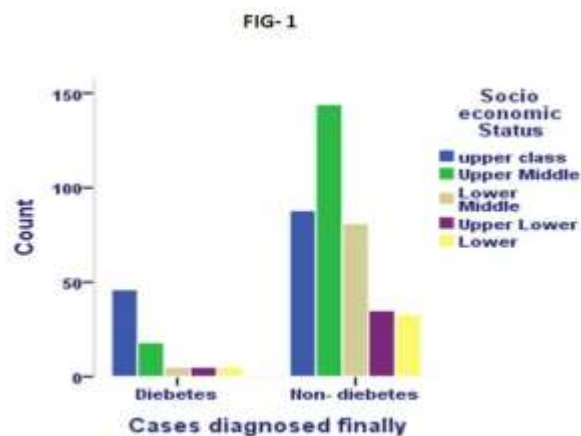


Table 1

**Physical activity;** There were 460 respondents, 255 have sedentary habit out of which 62(24.3%) were diabetic. Among 113 moderate worker 13(9.5%) were diabetic and among 40 heavy worker 4(10%) were diabetic It was observed that type 2 diabetes was more common amongst those with sedentary habits in comparison with heavy workers this deference is statistically significant (Chi square= 40.755, p value =.000) [Table 2, Fig. 2]

**Smoker:** There were 70(19.8%) diabetic among smoker and 9(8.4%) were diabetic among nonsmoker It was observed that type 2 diabetes was more common amongst smokers in comparison to non smokers this deference is statistically significant (chi square= 7.527 and P value= 0.006) [Table 3, Fig. 3]

**Alcoholic:** Out of total 460 respondents 232 were alcoholics and 228 non alcoholic, 60(25.9%) were found diabetic among alcoholic and 19(8.2%) persons were diabetic among non alcoholic. It was observed that type2 diabetes was more common amongst alcoholic in comparison to non alcoholics this deference is statistically significant (chi square=24.839 and p value= 0.000) [Table 4, Fig. 4].

Table 1

Socio Economic Status	Cases Diagnosed Finally		Total	Chi square	p value
	Diabetes	Non- diabetes			
Upper class	46	88	134	40.755	.000
	34.3%	65.7%	100.0%		
Upper Middle	18	144	162		
	11.1%	88.9%	100.0%		
Lower Middle	5	81	86		
	5.8%	94.2%	100.0%		
Upper Lower	5	35	40		
	12.5%	87.5%	100.0%		
Lower	5	33	38		
	13.2%	86.8%	100.0%		
Total	79	381	460		
	17.2%	82.8%	100.0%		

Table 2

Physical Activity	Cases Diagnosed Finally		Total	Chi square	p value
	Diabetes	Non- diabetes			
sedentary	62	193	255	22.332	.000
	24.3%	75.7%	100.0%		
Moderate	13	100	113		
	11.5%	88.5%	255		
Heavy	4	88	100.0%		
	4.3%	95.7%	113		
Total	79	381	255		
	17.2%	82.8%	100.0%		

Table 3

Smoking	Cases Diagnosed Finally		Total	Chi square	p value
	Diabetes	Non- diabetes			
Smoker	70	283	353	7.527	.006
	19.8%	80.2%	100.0%		
Non Smoker	9	98	107		
	8.4%	91.6%	100.0%		
Total	79	381	460		
	17.2%	82.8%	100.0%		

Table 4

Alcohol Intake	Cases Diagnosed Finally		Total	Chi square	p value
	Diabetes	Non- diabetes			
yes	60	172	232	24.839	.000
	25.9%	74.1%	100.0%		
No	19	209	228		
	8.3%	91.7%	100.0%		
Total	79	381	460		
	17.2%	82.8%	100.0%		

Table 5

Step 1	Variables in the Equation							
	B	S.E.	Wald	df	Sig.	Odds ratio	95% C.I. for Odds	
							Lower	Upper
Socio-economic status	1.074	.198	29.529	1	.000	2.927	1.987	4.311
Physical activity	.842	.226	13.918	1	.000	2.321	1.491	3.613
Smoking	1.183	.404	8.602	1	.003	3.266	1.481	7.202
Alcohol intake	1.612	.323	24.909	1	.000	5.014	2.662	9.444
Constant	-5.363	.888	36.469	1	.000	.005		

## Discussion

**Socioeconomic status:** In the present study modified B.G.PRASAD classification was adopted for socioeconomic classification. Out of 460 subjects maximum study subjects were from upper class i.e. 134 out of which 46(34.3%) were found diabetics and minimum study subjects from lower class i.e. 38 out of which 5(13.2%) were found diabetics. Ramachandran A et al. observed that the age standardized prevalence was 12.4% in the middle income group compared to 6.4% in the lower income group.<sup>(4)</sup> A study conducted by V Connolly et al had described a significant inverse relation between the prevalence of T2DM and socioeconomic status. The reason may be due to different composition of SES and classification criteria among the study subjects.<sup>(5)</sup>

**Physical activity:** The present study showed that maximum number of diabetic cases 66(44.3%) were found out of 255 sedentary worker. Similarly in the study of Sumanth Mallikarjuna Majgi et al at Rural Puducherry prevalence of diabetes decreased significantly as the physical activity level increased. This significance (OR 1.4, CI 0.96-2.1) faded under multivariate analysis.<sup>(6)</sup> Similar findings of significance of association of DM With physical activity were reported by certain Indian studies.

**Smoking:** In the present study there were 70(19.8%) diabetic among smoker and 9(8.4%) were diabetic among nonsmoker. Similar findings were reported by Julie C Will et al Sherman JJ et al and Solberg L et al. The study of Julie C will et al showed that as smoking increased, the rate of diabetes increased for both men and women. Among those who smoked  $\geq 2$  packs per day at baseline, men had a 45% higher diabetes rate than men who had never smoked, the comparable increase for women was 74%.<sup>(7)</sup>

Sherman JJ et al in his study found the prevalence of smoking among people with diabetes is similar to that in the general population but in the present study it is observed that smoking habit was higher among the diabetics as compared to non-diabetics.<sup>(8)</sup>

**Alcohol:** The present study showed that 25.9% alcoholic were diabetic. Similar findings were observed by Beulens JW et al in their study that amongst men, moderate alcohol consumption was non-significantly associated with a lower incidence of diabetes with a

hazard ratio (HR) of 0.90 (95% CI: 0.78-1.05) for 6.1-12.0 versus 0.1-6.0 g/day, adjusted for dietary and diabetes risk factors. However, the lowest risk was observed at higher intakes of 24.1-96.0 g day<sup>(-1)</sup> with an HR of 0.86 (95% CI: 0.75-0.98)<sup>9</sup>. In a study by Wei M et al it was observed that high alcohol intake was associated with approximately two fold increase in risk of type 2 DM when compared with moderate alcohol intake.<sup>(10)</sup> This is in contrast to the present study. And similar findings were observed by Carlson S et al. and Holbrook et al.<sup>(11,12,13)</sup> The explanation of this may be the shorter duration of alcohol intake and lower dose in the alcohol intake history.

## Conclusion

In the present study, socioeconomic status, smoking, alcohol intake, physical activities are found to be significantly associated with diabetes. Focus should be on spreading awareness in community regarding National programme for diabetes registry and prevention and control.

Life style modification focusing on maintaining normal body weight, increase physical activity, healthy food, stress management, yoga, meditation among population are mainstay for preventing and controlling Type 2 diabetes.

## References

1. Kaveeshwar SA, Cornwall J. The current state of diabetes mellitus in India. *The Australasian medical J.* 2014;7(1):45.
2. Ramachandran A, Shetty AS, Nandhitha A, Snehalatha C. Type 2 diabetes in India: challenges.
3. Madaan H, Agrawal P, Garg R, Sachdeva A, Partra SK, Nair R. Prevalence of diabetes mellitus in rural population of district Sonapat, India. 2014.
4. Alcohol and diabetes Factsheet Diabetes drinkaware.co.uk.
5. Mohan V et al. Secular trends in the prevalence of diabetes and impaired glucose tolerance in urban South India--the Chennai Urban Rural Epidemiology Study (CURES-17). *Diabetologia.* 2006 Jun;49(6):1175-8. Epub 2006 Mar 29.
6. Smoking and diabetes fact sheets www.ash.org.uk. June 2009.
7. Diabetes Mellitus and Associated Hypertension, Vascular Disease and Nephropathy: James R. Sowers, Murray Epstein, Hypertension. 1995;26:869-879 doi: 10.1161/01.HYP26.26.869.

8. Meyer A.K, Kushi HL, Jacobs JR RD, Folsom RA Dietary Fat and Incidence of Type 2 diabetes in older Iowa Women, *Diabetes care* 2001 & 2011;24:1528-1535
9. The association of hypertension and diabetes: prevalence cardiovascular risk and protection by blood pressure PMID 15868115 (Pub Med. indexed for Medline) Mohan V, Golkulakrishanan K, Deepa R, Shantirani CS, Datta, M.
10. Association of physical inactivity with components of metabolic of physical inactivity with components of metabolic syndrome and coronary artery diseases the Chennai Urban Population Study (CUPS no 15) *Diabet Med.* 2005;22:1206-11.
11. Taylor R, Ram P, Zimmet P. et al. Physical activity and prevalence of diabetes in Melanesian and Indian men in Fiji. *Diabetologia* 1984;24:578-82.
12. Wie M, Gibbons WL, Mitchell LT., Kampert BJ Blair NS Alcohol Intake and incidence of type 2 diabetes in Men. *Diabetes care* 2000,23:1:18-22.
13. Risk factors and complications of type 2 diabetes in Asians: Rajbharan Yadav, Pramil Tiwari and Ethiraj Dhanaraj *CRIPS Vol. No. 2 April-June 2008.*