International Journal of Community Medicine and Public Health
Yadav BB et al. Int J Community Med Public Health. 2017 May;4(5):1674-1677
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20171782

Original Research Article

Prevalence of type 2 diabetes mellitus among non teaching staff of a medical college in North Karnataka: a cross sectional study

Birendra Babu Yadav[1]*, Shivaswamy M. S.[2], M. D. Mallapur[3]

[1]Department of Public Health, [2]Department of Community Medicine, [3]Department of Statistics, Jawaharlal Nehru Medical College, Belgavi, Karnataka, India

Received: 20 March 2017
Accepted: 08 April 2017

***Correspondence:**
Birendra Babu Yadav,
E-mail: birendrababuyadav@gmail.com

ABSTRACT

Background: Diabetes threatens to assume pandemic level by 2030 and there is no available statistics of type2 diabetes mellitus on non-teaching staff. The risk factors like bad habits, family history, waist hip ratio (≥ 0.9 in males and ≥0.85 in females), BMI (≥28) and IDRS (>60) all attributed to the high prevalence of pre-diabetic as well as diabetes. Aims: To know the prevalence of Type 2 Diabetes Mellitus among non-teaching staff and to determine the risk factors associated with it.
Methods: A facility based cross – sectional study was conducted among all the non-teaching staff of Jawaharlal Nehru Medical College, Belagavi from February to October 2014.A total 500 (394 males and 106 female) participants between age group 20-59 years were selected for the study. After taking written informed consent, information regarding socioeconomic and risk factors were collected though pre – tested questionnaire. Physical examination were done to calculate BMI, Waist –Hip ratio and IDRS (Indian diabetes risk score). The random blood sugar was estimated to identify the diabetes and pre-diabetics.
Results: The overall prevalence of diabetics and pre- diabetics was 5 per cent and 17 per cent respectively. The prevalence of diabetes was highest in age group 50-59 years. The risk factor like bad habit, waist hip ratio (≥0.9 in males and ≥0.85 in females), BMI (≥28) and IDRS (>60) attributed to high prevalence of pre diabetics and diabetics.
Conclusions: The prevalence of diabetes was more among non-teaching staff so; both preventive and curative services should be provided to them.

Keywords: Type 2 diabetes, Prevalence, Non-teaching staff, Random blood sugar

INTRODUCTION

It has been projected that Type 2 Diabetes, (T2DM) will be around 438 million globally by 2030 which threatens assume to a pandemic and India will be the diabetes capital of the world.[1] The awareness in non-teaching staff about risk of diabetes is low in compared to teaching staff in the medical college. Dietary changes, physical inactivity, prolonged working hour, unhealthy life style are more among them. Also, they are in more stress in compared to the teaching staff. There is also no available statistics regarding the burden of type 2 diabetes among the non-teaching staff of a medical college and hence they were selected for the study.

METHODS

A facility based cross sectional study was conducted among all the non-teaching staff of Jawaharlal Nehru Medical college, Belagavi from February to October - 2014. Total 500 (394 males and 106 female) non-teaching staff between age group 20-59 years as per list of employees received from the institutional office were selected for the study. The study subjects who were not

available for checkup even after two follow up were excluded in the study.

Information regarding socioeconomic status and risk factors were collected through pre-tested questionnaire. Study participants were asked regarding regular physical activity, family history of diabetes, regarding personnel history. Weight was measured with minimum clothing to the nearest to 0.1 kg using a standard adult portable weighing machine. Height was measured without footwear using a standard calibrated stadiometer with 0.1cm accuracy. BMI of subjects were calculated and classified based on Asian standards.[2] Waist hip ratio of subjects were calculated and classified according to WHO criteria.[3] Socioeconomic status were assessed using modified B.G Prasad's classification (April 2013).[4] Indian diabetes risk score (IDRS) was calculated using all four parameters (age, waist circumference, physical activity and family history of diabetes) and subjects were categorized into three group based on it, low risk (IDRS <30), medium risk (IDRS 30-50), high risk (IDRS >60).[5] Random blood sugar of subjects was estimated for pre-diabetics and diabetics, according to American diabetes association criteria.[6]

***Statistical* analysis**

Data entry and analysis was done by using SPSS Software (SPSS 20.0 Version). Chi- square (χ^2) and Fishers exact test were used for association of diabetes with various risk factors at the 5 per cent level of significance.

RESULTS

In the study, majority of non-teaching staffs were male (78.8 per cent) compared to female (21.2 per cent). Most of participant's age was in between 30–39 years and majority of them were married. The study population comprised predominantly of hindu and belongs to general categories and consumed mixed diet. According to socioeconomic status of participants, majority of them belonged to class III and class IV. Most of staff had attained secondary level of education (Table 1).

According to personal habits, 47 per cent (235) had bad habits and most of them chewed tobacco followed by alcohol and smoking (Table 2).

According to Asian BMI classification, among study population, 173 (34.6 per cent) was overweight and 40 (8 per cent) were obese (Table 3).

In the study population, overall prevalence of pre diabetics and diabetics was 17.0 per cent and 5.0 per cent. Both the prevalence of pre diabetes and diabetes was more in males 74 (18.8 per cent) and 25 (6.3 per cent) compared to females. Prevalence of diabetes was more (13.7 per cent) in elderly age group (50–59 years) and pre diabetes was more (27.5 per cent) age group 40-49 years.

Table 4 described the association of diabetes prevalence with biosocial characteristics and risk factors.

Table 1: Distribution of respondent according to socio-demographic profile and IDRS.

Categories	Frequency	Percentage
Age group in years		
20-29	117	23.3
30-39	157	31.4
40-49	131	26.2
50-59	95	19
Gender		
Male	394	78.8
Female	106	21.1
Religion		
Hindu	468	93.6
Muslim	19	3.8
Christian and others	13	2.6
Educational Status		
Illiterate	70	14
Primary (1-5 years)	77	15.4
Secondary (6-10)	218	43.6
>10yr study	135	27
Socioeconomic class		
I	19	3.8
II	74	14.8
III	180	36
IV	193	38.6
V	34	6.8
IDRS Score		
Low risk (<30)	164	32.8
Medium Risk (30-50)	198	39.6
High Risk (>60)	138	27.6

Table 2: Distribution of study subjects by type of personal habits: (n=235).

Habits	No of subjects	%
Tobacco Consumption	96	19.2
Smoking	19	3.8
Alcohol	74	14.8
Alcohol+ Smoking	9	1.8
Alcohol+ Tobacco	37	7.4
No habits	265	53

Table 3: Distribution of study subjects by BMI: (Asian standards).

BMI	Frequency	%
<17.5 (underweight)	24	4.8
17.5-22.99 (normal weight)	263	52.6
23.0-27.99 (overweight)	173	34.6
≥28 (obesity)	40	8
Total	**500**	**100**

Table 4: Association of diabetes prevalence with certain biosocial characteristics and risk factors.

Biosocial characteristics		Normal (%)	Pre diabetes	diabetes	Statistical value
Age in years	20-29	106(90.6)	11(9.4)	0	Fisher exact test=48.540 df=6 P= <0.001
	30-39	137(87.3)	16(10.2)	4(2.5)	
	40-49	87(66.4)	36(27.5)	8(6.1)	
	50-59	60(63.2)	22(23.2)	13(13.7)	
Genders	Male	295(74.9)	74(18.8)	25(6.3)	Yates corrected χ^2 = 12.526 df=2 P=<0.002
	Female	95(89.6)	11(10.4)	0	
Religion	Hindu	360(76.9)	83(17.7)	25(5.3)	Fisher exact test=4.409 df=2 P=0.007
	Muslim and other	30(93.8)	2(6.2)	0	
Categories	SC/ST	52(75.4)	12(17.4)	5(7.2)	χ^2 =2.781 df=4 P=0.595
	OBC	126(81.8)	21(13.6)	7(4.5)	
	General	212(76.5)	52(18.8)	13(4.7)	
Education	Illiterate	57(81.4)	13(18.6)	0	Fisher exact test=8.061 df=6 P=0.283
	Primary	64(83.1)	9(11.7)	4(5.2)	
	Secondary	166(76.1)	37(17)	15(6.9)	
	Graduate	103(76.3)	26(19.3)	6(4.4)	
SEC	I	10(52.6)	4(21.1)	5(26.3)	Fisher exact test=14.949 df=6 P=<0.001
	II and III	197(77.6)	4618.1)	11(4.3)	
	IV	158(81.9)	27(14)	8(4.1)	
	V	25(73.5)	8(23.5)	1(2.9)	
Risk factors					
Type of diet	Vegetarian	103(71)	35(24.1)	7(4.8)	χ^2=7.403 df =2 P=0.025
	Mixed	287(80.8)	50(14.1)	18(5.1)	
Smoking	No	376(78.2)	83(17.3)	22(4.6)	χ^2=5.132 df =2 P=0.077
	yes	14(73.7)	2(10.5)	3(15.8)	
Tobacco	No	325(80.4)	65(16.1)	14(3.5)	χ^2=12.552 df=2 P=0.002
chewing	Yes	65(67.7)	20(20.8)	11(11.5)	
Alcohol	No	336(78.9)	71(16.7)	19(4.5)	χ^2=2.148 df=2 P=0.342
	Yes	54(73)	14(18.9)	6(8.1)	
Tobacco+ Alcohol	No	366(79)	74(16)	23(5)	Yates corrected χ^2 = 4.706 df=2 P=<0.095
	Yes	24(64.9)	11(29.7)	2(5.4)	
BMI	<17.5(underweight)	24(100)	0	0	Fisher exact test=56.223 df= 6 P=<0.001
	17.5-22.99(normal)	232(88.2)	25(9.5)	6(2.3)	
	23.0-27.99(overweight)	115(66.5)	44(25.4)	14(8.1)	
	≥28(obesity)	19(47.5)	16(40)	5(12.5)	
Waist hip ratio Male	<0.9	91(89.2)	87.8	3(2.9)	Yates corrected χ^2 = 9.633 Df=2 P=0.008
	≥0.9	299(75.1)	77(19.3)	32(5.5)	
Female	<0.85	20(100)	0	0	Yates corrected χ^2 = 1.139 Df=1 P=0.0286
	≥0.85	370(77.1)	85(17.7)	25(5.2)	
IDRS Score	≤30	152(92.7)	12(7.3)	0	Yates corrected χ^2 = 58.289 Df=4 P=<0.001
	30-50	159(80.3)	30(15.2)	9(4.5)	
	≥60	79(57.2)	43(31.2)	16(11.6)	

DISCUSSION

In the present study, the overall prevalence of pre-diabetes and diabetes was 17 percent and 5 percent. Similar result was found with the study conducted among the employees in University hospital, Thailand during 2009, where the overall prevalence of diabetes among University staffs was 6.5 percent.[7] Prevalence of diabetes was more (13.7 percent) in elderly age group (50–59 years) and pre-diabetic was more (27.5 percent) in age group 40-49 which is significant (p =>0.001). The result of our study were similar to National survey of diabetes that was conducted in six major cities of India in 2000, where the prevalence of diabetes mellitus among population age more than 40 years were (15.5).[8] In present study, the prevalence of diabetes among higher class (class-l) was 26.3 per cent which is similar to the study done by National urban diabetes survey in 2000,

where the prevalence of diabetes among higher income group were (21.6 percent).[9] In present study, the prevalence of diabetes were more among individual who smoke (15.8 percent) and chew tobacco (11.5 percent), which comparatively high in our study. The prevalence among alcohol consumers was slightly less (8.1 percent) in compared to them. The similar prevalence (8.64 per cent) of diabetes was seen among alcohol drinkers in the study conducted selected institution at Bishoftu Town, Eastshoa, Ethiopia in 2012.[10] In present study population, the prevalence of pre diabetic and diabetic among subjects who had family history of diabetic was 23 (29.1 percent) and 2 (2.5 percent). The study conducted in Rural central Kerala in 2007 done showed the prevalence among diabetic who had family history of diabetic was 24.2 per cent which is different from our study.[11] In present study, the prevalence of diabetes among obese (BMI ≥28) participant were 12.5 per cent, which is similar with study conducted in one of the administrative Blocks of Central Kashmir in 2011, where the prevalence of diabetes was 14.37 per cent among obese.[12] In present study 138 (27.6 percent) had high IDRS and 198 (39.6 percent) had medium IDRS. The prevalence of diabetes among who had IDRS high (>60) was 11.6 per cent and 31.2 per cent were pre-diabetic who had medium IDRS (30-50). Similar study was conducted by Pondicherry Institute of Medical Science in 2007, where the 76.47 per cent participants had high IDRS.[13]

CONCLUSION

The present study showed that the prevalence of pre diabetics and diabetes was more among males' non-teaching staff in compared to females' non-teaching staff in the medical college in age group between 50-59 years. Prevalence was more in higher socioeconomic class. The risk factors like bad habits, family history, waist hip ratio (≥ 0.9 in males and ≥0.85 in females), BMI (≥28) and IDRS (>60) all attributed to the high prevalence of pre-diabetic as well as diabetes. The present study showed the significance association of Type 2 diabetes mellitus with age, sex, family history, mixed diet, tobacco chewing, waist hip ratio (Males), BMI and with IDRS.

ACKNOWLEDGEMENTS

I sincerely thank Dr. A.S. Godhi, Former Principal, JNMC, Dr. (Mrs.) N.S. Mahantashethi, Principal, JNMC, Dr. (Mrs.) Vijaya A Naik, Former HOD, Public Health, JNMC, Dr. (Mrs.) Mubashir Angolkar, Associate Prof and I/C HOD, Public Health, JNMC, Belagavi for providing me employees records. I thanks to my friends for helping me during data documentation.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the J.N.M.C Institutional ethics committee on human subjects. Approval number: MDC/MOME/28

REFERENCES

1. Gupta V. Type 2 diabetes mellitus in India; South Asia Network for Chronic disease, New Delhi, 2012.
2. BMI (Body Mass Index) Classification for Asians. 2013. Available at: http://www.protectyour healthtips.blogspot.com/bmi-bodymass-index-classification. Accessed on 2 March 2017.
3. World Health Organization (WHO), Technical Report Series (TRS) 894, 2000.
4. Dudala SR, Arlappa N. An updated Prasad's socio economic status classification for 2013. Int J Res Dev Health. 2013;1(2):26-8.
5. Indian Diabetes Risk Score (IDRS). 2014. Available at: http://www.cardiresearch.org>topic>diabetes> epidemic in India. Accessed on 2 March 2017.
6. American Diabetes Association (ADA). 2014. Available at: http:// www.amc.edu/.../American diabetes association recommendation. Accessed on 2 March 2017.
7. Jiamjarasrangsi W, Lertmaharit S, Sangwatanaroj S, et al. Type 2 Diabetes, Impaired fasting glucose, and their association with increased hepatic enzyme levels among the Employees in a University Hospital in Thailand. J. Med Assoc Thai 2009;19(7).
8. Ramachandran A, Snehalatha C, Kapur A, Vijay V, Mohan V, Das AK, et al. High prevalence of diabetes and impaired glucose tolerance in India: National Urban Diabetes Survey. Diabetologia. 2001;44:1094-1101.
9. Ahuja MMS. Epidemiological studies on diabetes mellitus in India. In: Ahuja MMS, editor. Epidemiology of developing countries. New Delhi: Interprit; 1979; 29-38.
10. Megerssa YC, Gebre MW, Birru SK, Goshu AR, Tesfaye DY. Prevalence of Undiagnosed Diabetes Mellitus and its Risk Factors in selected institutions at Bishoftu Town, East Shoa, Ethiopia. J Diabtes Metab. 2013;S12:2-7.
11. Vijayakumar G, Arun R, Kutty VR. High Prevalence of Type 2 Other Metabolic Disorders in and Rural Central Kerala. JAPI. 2009;57:563-67.
12. Ahmad J, Masoodi MA, Ashraf M, Rashid R, Ahmad R, Ahmad A, et al. Prevalence of Diabetes Mellitus and its Associated Risk Factors in Age Group of 20 Years and Above in Kashmir, India. Al Ameen J Med Sci. 2011;4(1):38-44.
13. Gupta SK, Singh Z, Purti AJ, Vishwanathan M. Diabetes Prevalence and its risk factors in Urban Pondicherry. Int J Diab Dev Ctries. 2009:1(2):26-8.

Cite this article as: Yadav BB, Shivaswamy MS, Mallapur MD. Prevalence of type 2 diabetes mellitus among non teaching staff of a medical college in North Karnataka: a cross sectional study. Int J Community Med Public Health 2017:4:1674-7.