



DIABETES MELLITUS: PREVALENCE AND CONTROL MEASURES AMONG DIABETIC RESPONDENTS RURAL OF KALLAIKURICHI DISTRICT, TAMILNADU.

Epidemiology

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ABSTRACT

Background: According to the World Health Organization (WHO), Diabetes is one of the most common diseases, yet among the most neglected, public health problems in both developed and developing countries. Therefore, it is important to access the prevalence and control measures in rural India. **Methods:** It is a Cross-Sectional Study carried out in the Kallaikurichi district of Tamilnadu, India. Simple random sampling is used to select villages and respondents. Respondents were interviewed using a set of questionnaire and data was analyzed using Statistical Package Social Sciences (SPSS) version 17. **Results:** Prevalence of Diabetes Mellitus is 27.2% and Significant association was found on dietary habits $P < .0004$ and Physical activity $P < 0.02$. **Conclusions:** Awareness program on dietary practice and self-management should be strengthened so that the community can practice a healthy diet as one of the preventions for diabetes mellitus. Regular screening programs should be conducted in the Peripheral hospitals of rural areas. $P < 0.05$ was considered to be significant.

KEYWORDS

Diabetes Mellitus, Non-Communicable diseases, Prevalence, Rural Epidemiology.

INTRODUCTION

The overall number of diabetic patients is currently about 200 million and it is estimated that this number will reach 330 million by 2025. Several complications caused by diabetes will bring serious damages to human beings. Long periods of hyperglycaemia or hypoglycaemia represent a major issue in diabetes therapy since they can cause sudden coma and brain damage. It is in the status of a potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease [1]. Such complications can be prevented or retarded by controlling the glucose level. The global prevalence of diabetes among adults over 18 years of

age has risen from 4.7% in 1980 to 8.5% in 2014 [2]. Diabetes mellitus which accounts for 5.2% deaths worldwide and the fifth leading cause of deaths is one of the main risk factors for developing myocardial infarction, peripheral vascular disease, stroke, and renal complications [3]. South Asians with type 2 diabetes often have delayed diagnosis and inadequate management of glycemia and other risk factors, leading to severe microvascular and macrovascular complications in this population [4,5]

METHODOLOGY:

A cross-sectional study was conducted in the rural villages of the Kallaikurichi district Tamilnadu. Simple random sampling has been used to select the villages and to choose the respondent's houses in the village. Only residents aged 20 years old and above, and the residents for at least three months were selected as samples. Those who refused to participate in the survey or were not there during the survey after three visits were excluded from the study.

Data were collected through a Semi-Structured questionnaire. A diabetic patient is a person who has previously been diagnosed with diabetes type 1 or 2 by a trained health professional. Adequate dietary practice means intake of at least 3 servings of fruits and vegetables per day and at least 6 glasses of plain water per day.

The data has been analyzed using Social Sciences (SPSS) version 17. Univariate Statistics is performed. The association between diabetes mellitus status and dietary practice, physical activity was determined by the Chi-Square test. The level of significance was set at $p < 0.05$ and a confidence level of 95%.

RESULT:

A total of 283 participants participated in this study. The mean age of the study is 33. Among the 283 respondents, 27.2% was suffering from diabetes Mellitus. (Tab-1)

The majority of the diabetic patients of our study are above 59 of age. Comparing men, females are more suffering from diabetes. It may be due to poor physical activity. No formal Education, Pensioner, Housewife, Divorced/Window had more risk of diabetes comparing

others. Education, Physical Activity, and Dietary pattern play a major role in managing Diabetes.

Tab 1: Diabetes Mellitus status by socio-demographic

Socio-demography	Diabetes Mellitus Status		
	Yes n (%)	No n(%)	Total n(%)
Age			
20 - 29	0	27 (100)	27 (100)
30 - 39	7 (15.2)	39 (84.7)	46 (100)
40 - 49	15 (24.5)	46 (75.4)	61 (100)
50 - 59	25 (31.6)	54 (68.4)	79 (100)
> 59	30 (42.8)	40 (57.2)	70 (100)
Gender			
Male	49 (27.5)	129 (72.4)	178 (100)
Female	28 (36.3)	77 (63.7)	105 (100)
Education			
No formal Education	20 (35)	37 (65)	57 (100)
Primary Education	15 (27.2)	40 (72.72)	55 (100)
Secondary Education	17 (28.8)	42 (71.2)	59 (100)
Diploma	12 (20)	48 (80)	60 (100)
Graduate and Above	13 (25)	39 (75)	52 (100)
Occupation			
Unemployed	6 (19.3)	25 (80.6)	31 (100)
Agriculture	25 (29.4)	60 (70.6)	85 (100)
Government	3 (15)	17 (85)	20 (100)
Private	4 (19)	21 (81)	25 (100)
Pensioner	15 (39.4)	23 (60.4)	38 (100)
Housewife	15 (31.9)	32 (68.1)	47 (100)
Self-employed	9 (24.3)	28 (75.7)	37 (100)
Marital Status			
Never Married	0	39 (100)	39 (100)
Married	66 (31.1)	146 (68.8)	212 (100)
Divorced/Window	11 (34.3)	21 (65.7)	32 (100)

Tab 2: Association between diabetes status and dietary practice

Diabetes Status	Dietary practice		Total	P-Value
	Adequate n (%)	Inadequate n (%)		
Yes	1 (1.3)	76 (98.7)	77 (100)	0.004
No	35 (16.9)	171 (83.1)	206 (100)	

Among diabetic respondents, 98.7% have inadequate diet practices.

Tab 3: Association between diabetes status and physical activity

Diabetes Status	Physical activity		Total n (%)	P-Value
	Yes n (%)	No n (%)		
Yes	22 (28.5)	55 (71.5)	77 (100)	0.024
No	89 (43.2)	117 (56.8)	206 (100)	

Among diabetic respondents, nearly 71.5% have poor physical activity. Table 2 and Table 3 shows the strong association between diabetes status with dietary practice and physical activity.

Tab 4: Health premise for diabetic management among diabetic respondents

Health premise	n	%
Government PHC, CHC	66	86%
Private clinic	7	9%
Pharmacies, Health dispensaries	4	5%
Total	77	100

The Majority (86%) of the diabetic respondents seek their diabetic management from Government primary health centers.

Tab 5: Activities have taken for controlling diabetes among diabetic respondents

Activities	n	%
Medication	31	40
Diet control	24	31.7
Exercise	7	9.3
None	15	19
Total	77	100

Most of the diabetic respondents (40%) taking medication as advised by a health professional (Table 5). Whereas, 31.7% and 9.3% control their diabetes with diet and exercise, respectively.

DISCUSSION

A cross-sectional study was conducted to determine the prevalence of diabetes in rural areas since diabetes has become one of the endemic diseases globally. The overall prevalence of Diabetes among the community was higher compared to the national prevalence (27.2%) [6]. This may due to the different geographical areas of the study done nationally, where the prevalence of rural is high. The recent report by Anjana et al. also showed a high prevalence of diabetes in the male population [6] but in our study females had an 8.8% higher rate of diabetes than men. In our study, the Age Group of Above 50 constitutes about 74.4% of total prevalence. This could be due to poor immunity, lesser physical activity, and poor social support.

Nearly 30% of the rural agricultural workers had diabetes, it could be due to poor nutrition and improper dietary habits although they are very physically active. Thus, this study gives strong evidence of dietary habits. Drewnowski and Specter studied person who eats less and poor healthy dietary habits suffer from the highest rates of obesity and type 2 diabetes [7]. In a study conducted by Rampal (2010), the prevalence of diabetes is higher among Indians (27.3%) compared to Chinese (11.7%) [8] which is the same as our finding. Nearly 86% of the respondents visit government clinics and 40% take medication regularly, which reduces their out of the pocket expenditure.[9]

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Compliance with Ethical Standards. Informed Consent Obtained. The objective of the study was explained to each participant and counseling on prevention and self-management of diabetes was given at the end of the session.

CONFLICT OF INTEREST – None.

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REFERENCES

- Joshi SR, Parikh RM. India - diabetes capital of the world: now heading towards hypertension. *J Assoc Physicians India*. 2007;55:323–4.
- WHO. 2018. Diabetes, 30 October, 2018
- Domingueti, C.P., Dusse, L.M.S., Carvalho, M. das G., de Sousa, L.P., Gomes, K.B., Fernandes, A.P. 2016. Diabetes mellitus: The linkage between oxidative stress, inflammation, hypercoagulability and vascular complications. *Journal of Diabetes and Its Complications*. 30(4), 738–745.
- Misra, A.; Sattar, N.; Tandon, N.; Shrivastava, U.; Vikram, N.K.; Khunti, K.; Hills, A.P. Clinical management of type 2 diabetes in south Asia. *Lancet Diabetes Endocrinol*. 2018, 6, 979–991. [CrossRef]
- Yadav, D.; Mishra, M.; Joseph, A.Z.; Subramani, S.K.; Mahajan, S.; Singh, N.; Bisen, P.S.; Prasad, G.B.K.S. Status of antioxidant and lipid peroxidation in type 2 diabetic human subjects diagnosed with and without metabolic syndrome by using NCEP-ATPIII, IDF and WHO criteria. *Obes. Res. Clin. Pract*. 2015, 9, 158–167.
- Anjana, R.M.; Pradeepa, R.; Deepa, M.; Datta, M.; Sudha, V.; Unnikrishnan, R.; Bhansali, A.; Joshi, S.R.; Joshi, P.P.; Jaynik, C.S.; et al. Prevalence of diabetes and prediabetes (impaired fasting glucose and/or impaired glucose tolerance) in urban and rural India: Phase I results of the Indian Council of Medical Research-India Diabetes (ICMR-INDIAB) study. *Diabetologia* 2011, 54, 3022–3027. [CrossRef] [PubMed]
- Drewnowski, A.; Specter, S.E. Poverty and obesity: The role of energy density and energy costs. *Am. J. Clin. Nutr*. 2004, 79, 6–16. [CrossRef]

- Rampal, S., Rampal, L., Rahmat, R., Azhar Md Zain, Yee Guan Yap, Mohamed, M., & Taha, M. 2010. Variation in the Prevalence, Awareness, and Control of Diabetes in a Multiethnic Population: A Nationwide Population Study in Malaysia. *Asia Pacific Journal of Public Health*. 22(2), 194–202.
- Nandi S, Schneider H, Dixit P. Hospital utilization and out of pocket expenditure in public and private sectors under the universal government health insurance scheme in Chhattisgarh State, India: Lessons for universal health coverage. *PLoS One*. 2017;12(11):e0187904. Published 2017 Nov 17. doi:10.1371/journal.pone.0187904
- Vinay, D. 2017. The role of diet & exercise in controlling Diabetes. *Nutrition & Fitness*. 24th July, 2017.
- Connolly, V., Unwin, N., Sherriff, P., Bilous, R., Kelly, W. 2000. Diabetes prevalence and socioeconomic status: a population based study showing increased prevalence of type 2 diabetes mellitus in deprived areas. *J. Epidemiol Community Health*. 54(3): 173–177.
- WHO. Diabetes Mellitus; WHO: Geneva, Switzerland, 2010.
- IDF Diabetes Atlas 8th Edition Across the Globe. Available online: <https://www.diabetesatlas.org/across-theglobe.html> (accessed on 1 May 2017).
- International Diabetes Federation Diabetes Atlas. 4th ed. 2009. Brussels, Belgium, International Diabetes Federation.
- Herquelot, E., Guéguen, A., Bonenfant, S., Dray-Spira, R. 2011. Impact of Diabetes on Work Cessation, Data from the GAZEL cohort study. *Diabetes Care*. (6): 1344–1349.
- Gopichandran, V., Lyndon, S., Angel, M. K., Manayalil, B. P., Blessy, K. R., Alex, R.G., Kumaran, V., Balraj, V. 2012. Diabetes self-care activities: A community-based survey in urban southern India. *The National Medical Journal of Indian*. 25 (14–17).