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Physical activity pattern and life style habits among rural and urban diabetic subjects

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Abstract

The present study was carried out at Fatehabad district of Haryana State to study physical activity pattern and life style habits among rural and urban diabetic subjects. Two hundred subjects (male and female) between the age of 40-60 years and who were suffering from non-insulin dependent diabetes mellitus (NIDDM) for more than 6 months or above were selected randomly on the basis of their medical report (fasting and post prandial blood glucose level) from various Government and Private hospitals. It was observed that highest per cent of rural as well as urban respondents reported onset of diabetes between the age of 41-50 years. Most of the respondents (47% rural and 40% urban) had been suffering from diabetes for last 6-10 years. Majority (42% rural and 48% urban) had fasting blood glucose between 121-200 mg/100ml. Average fasting blood glucose was 166.51mg/100ml. Eight per cent of rural and fifteen per cent of urban respondents depicted very poor control and had post prandial blood glucose more than 300 mg/100ml. Majority (66 per cent of rural and 89 per cent of urban respondents) were involved in sedentary occupation and were not spending time (54% rural and 35% urban) on any kind of exercise. Fifty-four per cent of rural respondents and 63 per cent of urban respondents had family history of diabetes. Of the total, 26 per cent of rural and 17 per cent of urban respondents were consuming alcohol. Thirty-six per cent of rural and 18 per cent of urban respondents were regular smokers. It can be concluded that urban respondents are maintaining healthier eating habits, healthier lifestyle and are also showing better management of blood sugar control as compared to rural counterparts. There is need of more awareness in both rural and urban areas for better management of diabetes.

Keywords: lifestyle, physical activity, rural, urban and diabetic

Introduction

India is rapidly becoming industrialized and urbanized leading to unhealthy life style changes adversely affecting metabolic functions and thereby increasing the disease rate including diabetes several folds. It has also been associated with an increased risk for arteriosclerosis due to increase in triglycerides and low density lipoprotein levels. About 70-80% of deaths in diabetic patients are due to vascular disease (Asif 2014; Patro *et al.* 2014; Dinesh *et al.* 2016) [1, 9, 3].

The number of people with diabetes in India increased from 26 million in 1990 to 65 million in 2016. High prevalence of diabetes is reported in economically and epidemiologically advanced states such as Tamil Nadu and Kerala, where many research institutes which conduct prevalence studies are also present.

Diabetes is closely related to diet and management (Hulsegge *et al.*, 2021; Li *et al.*, 2021)^[4, 6]. The two major goals in management of diabetes are, to achieve metabolic control near normal and to prevent or delay the complications. Type 2 Diabetes occurs particularly in people that are 35 years and above. People with this disease often become obese because they over eat due to the cell's resistance to insulin. The problem of underweight is also prevalent due to poor glycemic control. The socio-demographic differences between rural and urban population are very likely to affect the management of diabetes. Urbanization influences lifestyle and socioeconomic activities and is one of the drivers of a country's health transition. City dwellers have the advantage of better access to healthcare services, education as well as social services. On the other hand, adverse changes such as nutrition transition with an increase in the

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consumption of saturated fats and sugar and a more sedentary lifestyle is often reported in urban areas (Aung *et al.*, 2018; Kumari *et al.*, 2022) [2,5].

Keeping all these facts in view, the present study is planned to assess the nutritional status of non-insulin dependent diabetes mellitus patients from Fatehabad district of Haryana State.

Materials and Methods

The present survey was carried out on 200 non-insulin dependent diabetes mellitus (NIDDM) subjects (male and female) between the age of 40-60 years. Subjects who were suffering from non-insulin dependent diabetes mellitus for more than 6 months or above were selected randomly on the basis of their medical report (fasting and post prandial blood glucose level) from various Government and Private hospitals. The requisite information was collected through a well-structured pre tested questionnaire. Individual interviews were conducted to collect data on socio-demographic characteristics including duration of diabetes, marital status, educational level, income, and employment status. Subjects were also asked to record all foods and beverages consumed in the 24-h period over 3 consecutive days. Activity pattern of the diabetic subjects was recorded from their daily routine like type of physical exercise, frequency of physical exercise, time spent on physical exercise etc. and other recreational activities were recorded.

Information on biochemical parameters like blood glucose level etc. of patients were collected from their medical history. The data were subjected to suitable statistical analysis using software SPSS version 20.0.

Results & Discussion

Personal profile of diabetic subjects

Personal profile of rural and urban diabetic subjects presented in Table 1. The subjects were in the age group from 40-60 years. Majority of subjects i.e., 53 percent were in age group of 51-60 years and 47 percent of subjects were in the age group of 40-50 years. The data reveals that in rural area, a higher per cent of subjects were illiterate (35%) followed by primary educated (24%). Only two per cent graduate. In urban area, 27 per cent subjects were educated up to intermediate postgraduate, 23 per cent were graduate, 15 Per cent were illiterate and only 2 per cent were post graduate.

In rural area, 24 per cent subjects were engaged in agriculture, 09 per cent were in pvt./govt. service, 08 per cent were entrepreneurs while 12 per cent were labourers. In urban area, higher percent of respondents (other than housewives) were in pvt./ govt. service, 17 per cent were entrepreneurs while 14 per cent were involved in Agriculture. Majority from both urban and rural area were married. Among rural respondents, 84 per cent hailed from joint family while 62 per cent of urban respondents came from nuclear families (Table 1).

A higher per cent of rural respondents were in income bracket of Rs. 20,000-40,000; while higher per cent of urban respondents had income above Rs. 40,000/- per month.

Status of diabetes

Highest per cent of rural as well as urban respondents reported onset of diabetes between the ages of 41-50 years (Table 2). Only 14 and 17 per cent respondents respectively reported onset of disease before 40 years of age. Most of the respondents (47% rural and 40% urban) had been suffering from diabetes for last 6-10 years.

Table 1: Personal profile of diabetic subjects

	Rural (n=100)	Urban (n=100)	Total (N=200)
Age group (years)			
40-50	40	54	94(47.0)
51-60	60	46	106(53.0)
Education			
Illiterate	35	15	50(25.0)
Primary	24	06	30(15.0)
Middle	13	13	26(13.0)
Matric	18	14	32(16.0)
Intermediate	08	27	35(17.5)
Graduate	02	23	25(12.5)
Postgraduate	-	02	02(1.0)
Occupation			
Service private/Govt.	09	25	34(17.0)
Pvt. Entrepreneurship	08	17	25(12.5)
Agriculture	24	14	38(19.0)
Housewife (female)	45	36	81(40.5)
Retired	02	08	10(5.0)
Labourer	12	-	12(6.0)
Marital status			
Single	-	-	-
Married	92	92	184(92.0)
Widow	08	08	16(8.0)
Divorcee	-	-	-
Separated	-	-	-
Family type			
Joint	84	38	122(61.0)
Nuclear	16	62	78(39.0)
Family size			
Small(<4 members)	02	21	23(11.5)
Medium(5-8 members)	55	71	126(63.0)
Large (>8 members)	43	08	51(25.5)
Family income/month(Rs.)			

<20,000	33	13	46(23.0)
20,000-40,000	49	32	81(40.5)
>40,000	18	55	73(36.5)

Figures in parentheses indicate percent respondents for respective variables in given column

Only 19 per cent of rural and 20 per cent of urban respondents reported being suffering for more than 10 years. Majority (42% rural and 48% urban) had fasting blood glucose between 121-200 mg/100ml. Only 35 per cent of rural and 29

per cent of urban respondents had fasting blood glucose between 100-120 mg/100ml. Average fasting blood glucose was 166.51 mg/100ml (Table 2).

Table 2: Status of diabetes

	Rural (n=100)	Urban (n=100)	Total (N=200)
Age of onset (years)			
30 – 40	14	17	31(15.5)
41 – 50	60	50	110(55.0)
51 – 60	26	33	59(29.5)
Average age of onset	47.25±5.90	48.10±7.05	47.67±6.50
Period of onset (years)			
1 – 5	34	40	74(37.0)
6 – 10	47	40	87(43.5)
>10	19	20	39(19.5)
Blood glucose (mg/100ml)			
Fasting			
<100	-	-	-
100 – 120	23	23	46(23.0)
121 – 200	42	48	90(45.0)
>200	35	29	64(32.0)
Average fasting blood glucose	170.46±41.69	162.56±39.63	166.51±40.76
Postprandial			
140 – 200	14	16	30(15.0)
201 – 250	31	32	63(31.5)
251 – 300	47	37	84(42.0)
>300	08	15	23(11.5)
Average post prandial blood glucose	243.91±43.75	241.79±50.41	242.85±47.09

Figures in parentheses indicate percent respondents for respective variables in given column

Post prandial blood glucose level was between 251-300 mg/100ml for majority (47% rural and 37% urban) of respondents. Eight per cent of rural and fifteen per cent of urban respondents depicted very poor control and had post prandial blood glucose more than 300 mg/100ml.

Physical activity pattern of diabetic subjects

Table 3 presents data on physical activity pattern of diabetic

subjects. The activity pattern of the subjects was recorded as a pre-requisite for understanding further intervention. Majority (66 per cent of rural and 89 per cent of urban respondents were involved in sedentary occupation. Majority (54% rural and 35% urban) were not spending time on any kind of exercise. About 27 per cent of rural and 35 percent of urban respondents were regular with at least half an hour of brisk walk.

Table 3: Physical activity pattern of diabetic subjects

	Rural (n=100)	Urban (n=100)	Total (N=200)
Work activity (Occupation)			
Sedentary	66	89	155(77.5)
Moderate	34	11	45(22.5)
Type of exercise			
Yoga	15	16	31(15.5)
Walking	27	35	62(31.0)
Yoga + walking	4	14	18(9.0)
None	54	35	89(44.5)
Frequency of exercise			
Daily	33	53	86(43.0)
Weekly	13	12	25(12.5)
Total time spend on exercise			
<15 min	19	30	49(24.5)
15–30 min	22	27	49(24.5)
>30 min	05	08	13(7.5)

Figures in parentheses indicate percent respondents for respective variables in given column

Risk factors among diabetic subjects

Among rural respondents, 54 per cent had had some family history of diabetes (Table 4). Twenty-nine per cent had single

parent diabetic while 14 per cent had both parents diabetic. Among urban respondents, 63 per cent had family history of diabetes. Thirty-three per cent had single parent diabetic

while 08 per cent had both parents diabetic. Of the total, 26 per cent of rural and 17 per cent of urban respondents were consuming alcohol. Three percent of rural respondents reported a daily consumption of alcohol. Thirty six per cent of rural and 18 per cent of urban respondents were regular smokers. Only fifteen per cent of rural and 07 per cent of urban respondents smoked more than 5 times per day. All the respondents who reported consumption of alcohol or smoking were males. None of the female respondents reported smoking or drinking occasional/regular.

Food habits of diabetic subjects

Table 5 presents the food habits of diabetic subjects under study. Ninety-one per cent of rural respondents and 74 per cent of urban respondents habitually took tea/coffee very often (more than 4 times per day). Fifty-nine per cent rural and 26 per cent urban respondents were adding sugar as

sweetener to their beverages/snacks; 15 per cent rural and 34 per cent urban respondents had completely stopped intake of sugar while 1 per cent rural and 21 per cent urban respondents had resorted to artificial sweeteners. Majority of respondents (80%) from both rural and urban area were vegetarian. Majority of rural respondents (69%) followed meal pattern of two meals per day while majority of urban respondents (84%) three meals per day. Consumption of fried snacks more than two times a week was common (66% rural and 87% urban respondents). Twenty-one and sixteen per cent of respondents from rural and urban area respectively did not consume any medicinal plant. Fenugreek seeds (23% rural and 36% urban) followed by bitter gourd (19% rural and 29% urban) and jamun seeds (13% rural and 25% urban) were the most common medicinal plants consumed by rural and urban diabetics to counter diabetes.

Table 4: Risk factors among diabetic subjects

	Rural (n=100)	Urban (n=100)	Total (N=200)
Family history	54	63	117(58.5)
No family history	46	37	83(41.50)
Single parent	29	33	62(31.0)
Both parents	14	8	22(11.0)
Siblings	11	22	33(16.5)
Alcohol Consumption			
Yes	26	17	43(21.5)
Never	74	83	157(78.5)
Frequency of alcohol consumption			
Daily	03	-	03(1.5)
Weekly	12	06	18(9.0)
Occasionally	11	11	22(11.0)
Smoking			
Smokers	36	18	54(27.0)
Non – smokers	64	82	146(73.0)
Frequency of smoking/day			
1-5	21	11	32(16.0)
>5	15	07	22(11.0)

Figures in parentheses indicate percent respondents for respective variables in given column

Physical activity pattern, life style and food habits of diabetics have been studied widely by scientists in varied demographic settings. Nazeer *et al.*, 2020^[8] carried out across sectional study comparing physical activity among patients from rural and urban areas in the province of Punjab, Pakistan. It was concluded that although, participants from rural areas are physical more active than participants from urban areas in terms of aerobic activity but there is no difference in the strength and flexibility among both groups and as a whole, participants from both group had equal level of physical activity. In another study Price *et al.*, 2018^[10] investigated the burden of diabetes and their associations with lifestyle and other factors in Malawi, a very poor country with a predominantly rural—but rapidly growing urban—population. It was observed that hypertension and diabetes were highly prevalent, more so in urban residents, the less poor, and better educated than in rural, the poorest, and least educated

participants. Three per cent of urban men (133 of 3928), 3% (225 of 7867) urban women, 2% (84 of 5004) urban men, and 2% (124 of 7116) urban women had diabetes. Of 566 participants with diabetes, 233 (41%) were undiagnosed. Fewer than half the participants on medication had well controlled diabetes (84 [41%] of 207 participants). Multimorbidity was highest in urban women (n=519, 7%). The authors emphasized urgent need of interventions.

Recently, Mercado *et al.*, 2021^[7], examined the relationships between diabetes management and rural and urban residence. They concluded that over two decades, rural U.S. adults with diabetes have had less improvement in BP and cholesterol control. In addition, rural-urban differences exist across socio demographic groups, suggesting that efforts to narrow this divide may need to address both socioeconomic and clinical aspects of care.

Table 5: Food habits among diabetic subjects

	Rural (n=100)	Urban (n=100)	Total (N=200)
Tea/ coffee			
Never	3	9	12(6.0)
Sometimes	6	17	23(11.5)
Very often	91	74	165 (82.5)
Added sugar			
With sugar	59	26	85(42.5)
Without sugar	15	34	49(24.5)
Artificial sweetener	1	21	22(11.0)
Jaggery	25	19	44(22.0)
Food habits			
Vegetarian	89	71	160(80.0)
Non – vegetarian	2	8	10(5.0)
Eggetarian	9	21	30(15.0)
Meal pattern			
2 meals	69	14	83(41.5)
3 meals	31	84	115(57.5)
4 meals	-	2	02(1.5)
Fried Snacks			
Very often	66	87	153(76.5)
Rarely	34	13	47(23.5)
Medicinal plants			
None consumed	21	16	127(63.5)
Bel fruit	16	13	29(14.5)
Jamun seeds/fruit	13	25	40(20.0)
Bittergourd	19	29	48(24.0)
Fenugreek seeds	23	36	59(29.5)
Giloy	8	13	21(10.5)

Figures in parentheses indicate percent respondents for respective variables in given column

Conclusion

It can be concluded that urban respondents are maintaining healthier eating habits, healthier lifestyle and are also showing better management of blood sugar control. There is need of more awareness in both rural and urban areas for better management of diabetes.

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