

Research Paper

Dietary and Life Style Practices and Health Complications of Adult Diabetic Women in Coimbatore

K. Vasantha¹ and D. Radhapriya^{1,*}

¹ Department of Lifelong Learning and Extension, Avinashilingam University for Women, Coimbatore – 641 043, Tamilnadu, India

* Corresponding author, e-mail: (radhapriya777@yahoo.com)

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Abstract: *Diabetes is a silent disease that brings several health complications in an individual life. The Indian population is more prone to diabetes and the rate is increasing in an alarming pace. India is identified as the diabetes capital of the world. Hence, there is an urgent need to identify the root cause for diabetes and lifestyle habits contributing to it. A detailed survey targeting women living in Coimbatore district, Tamilnadu, India was carried out. The present research studied the lifestyle habits, dietary pattern, family history and socio-economic background of the diabetic subjects. A meaningful co-relation between disease prevalence and contributing factors was arrived.*

Keywords: Women, Dietary habits, Lifestyle pattern, Health complications, Diabetes, Health risk.

Introduction

Women play a decisive role in ensuring the health, nutrition and overall well being of the entire family and intergenerational influence on the health of the future generation. Unfortunately in India the nutritional status of women is poor due to varied reasons. Women have unique medical problems and health care needs and women's health has been a global concern for many decades (WHO, 2000).

Women's poor health in India is bound with social, cultural and economic factors. The changing economic situation created by urbanization, industrialization and liberalization has affected the extent and the type of health related problems in women. Rapid industrialization, urbanization, globalization and economic development have resulted in a shift in dietary habits and lifestyle among populations particularly in developing countries. As per the International Diabetes Federation, India is the diabetes

capital of the world, with 40 million people living with diabetes. About 371 million people suffer from diabetes across the nation and half of the cases are undiagnosed (www.archive.indianexpress.com). Due to these changes chronic noncommunicable diseases like obesity, diabetes mellitus, cardiovascular diseases, hypertension and certain types of cancer are becoming increasingly the significant causes for disability and premature deaths in both developing and newly developed countries.

India is a large, developing country with diverse people, religion and diets. Over the last decade, economic transition in India has brought forth vast changes in lifestyle, which is primarily reflected in the nutritional transition. It is a mere coincidence that India is also witnessing a steady increase in the prevalence of diabetes. India currently, have around 40 million cases of Diabetes Mellitus and these numbers are projected to increase to 87 million by the year 2030 (Hasan and Khatoon, 2012). There are lots of interventions available for controlling and treating diabetes mellitus such as dietary management, lifestyle management, pharmacological treatment, nonpharmacological treatment etc.

Objectives

The present study was undertaken with the following objectives:

- To elicit the socioeconomic and dietary pattern background of the selected diabetic women
- To assess their life style practices, family history and food habits
- To study the health and nutritional status of the selected diabetic women

Methodology

The area selected for the present study was Coimbatore city of Tamilnadu state. About two hundred adult diabetic women in the age group of 45 - 65 years in and around the city were selected randomly and their socioeconomic and dietary details were collected through a structured interview schedule who expressed their willingness and cooperation for the study were selected.

The nutritional status of the selected diabetic women was assessed through anthropometric measurements such as height, weight and Body Mass Index (BMI) and dietary survey through 24 hours recall method.

Results and Discussion

The results pertaining to the present study are presented and discussed under the following headings:

A. Socioeconomic Background of the Selected Diabetics

The socio economic details of the selected diabetic women are presented in Table I.

Table I: Socio Economic Background of the Selected Diabetics

Details	Female (n=200)	
	No.	%
Age (Years)		
45 – 50	40	20
51 – 55	80	40
56 – 60	42	21
61 – 65	38	19

Educational Status		
Primary school	16	8
High school	28	14
Higher secondary	70	35
Under graduate	28	14
Post graduate	48	24
Uneducated	10	5
Monthly Income*		
Low Income (< Rs.5000)	38	19
Middle Income (Rs.5000- Rs. 20000)	136	68
High Income (> Rs.20000)	26	13
*HUDCO 2006, Classification		
Employment Status		
Employed	64	32
Unemployed	136	68
Work Type		
Sedentary	168	84
Moderate	24	12
Heavy	8	4

Epidemiological studies in India have revealed that the incidence of diabetes is on the increase particularly the peak being 50-60 years (American Diabetes Association, 2005). The present study also revealed that greater part 40 per cent of the selected diabetics belonged to the age group of 51-55 years.

Educational level is a socioeconomic factor that can influence diabetes. People with limited education and lack of proper nutrition knowledge have difficulty in managing the health related issues. Most of the selected diabetics were educated and among them, a majority of 35 per cent had higher secondary education and a minority of 5 per cent were uneducated.

Among the selected diabetics a majority of 68 per cent belonged to middle income group (Rs. 5000 – Rs. 20000) and a minority of 13 per cent belonged to high income group (> Rs.20000).

It was observed that a greatest percentage of selected diabetic females (68%) were unemployed and it is inferred that a majority of 84 per cent females of the selected diabetics were engaged in sedentary activity and a minority of four per cent females were engaged in heavy activity. Epidemiological studies have found that sedentary lifestyle is the underlying risk factor for obesity, diabetes, cardiovascular diseases, low HDL- cholesterol levels and hyper triglyceridemia (Martin *et al.*, 2007).

B. Dietary Pattern of the Selected Diabetics

Table II gives the details on the type of diet and meal pattern followed by the selected diabetics.

Table II: Diet and Meal Pattern of the Selected Diabetics

Particulars	Female (n = 200)	Per cent
<u>Diet pattern</u>		
Vegetarian	84	42
Non-vegetarian	106	53
Ova-vegetarian	10	5
<u>Meal Pattern</u>		
< 3 Meals	34	17
3 Meals	156	78
> 3 Meals	10	5
<u>Items Consumed</u>		
<u>Break fast</u>		
Rice based items	156	78
Wheat / other cereal items	44	22
<u>Mid morning</u>		
Beverage	64	32
Buttermilk	36	18
Snack items	22	11
None	78	39
<u>Lunch</u>		
Rice + Dhal + Vegetables	112	56
Rice + Dhal + Vegetables + Chappathi	24	12
Variety rice + Vegetables	64	32
<u>Evening</u>		
Beverage	96	48
Snack items + Beverage	76	38
None	28	14
<u>Dinner</u>		
Rice based items	98	49
Wheat / other cereal items	102	51
<u>Bed time</u>		
Milk	42	21
None	158	79

1. Type of Diet Consumed

It is observed that a majority of 53 per cent of the selected diabetics followed a non-vegetarian diet pattern and a minority of 5 per cent consumed ova vegetarian diet. The findings of the present study are on par with the results of Davis and Williams (2003), that 78 per cent of the people who consumed non-vegetarian foods are diabetics. India is said to be a vegetarian country predominantly but the food habits and dietary preference are constantly changing.

2. Meal Pattern of the Selected Diabetics

From Table II it is clearly understood that a majority of 78 per cent of the selected diabetics followed a three meal pattern and a minority of 5 per cent consumed more than three meals. Regarding the breakfast pattern more percentage (78 %) consumed rice based items and a lesser percentage (22 %) consumed wheat and other cereal items. For mid morning, a majority of adults did not consume any beverage or snacks.

For lunch, a majority of 56 per cent preferred rice with dhal and vegetables followed by variety rice with vegetables preferred by 32 per cent. For evening tea a majority of 48 per cent preferred beverage alone. With regard to dinner, majority preferred wheat and other cereal items and did not prefer to take milk during bed time.

3. Quantity of Food Consumption by Selected Diabetics

The quantity of foods consumed by the selected diabetics is presented in Table III.

Table III: Quantity of Food Consumed by Selected Diabetics

Food Groups	Quantity (g)	Female	
		No.	%
Cereals	150-200	42	21
	200-250	66	33
	250-300	92	46
	Total	200	100
Pulses	30-40	52	26
	40-50	102	51
	50-60	46	23
	Total	200	100
Green leafy vegetables	40-50	42	21
	50-60	82	41
	60-70	76	38
	Total	200	100
Vegetables	50-75	112	56
	75-100	52	26
	>100	36	18
	Total	200	100
Roots and tubers	50-75	138	69
	75-100	50	25
	100-150	12	6
	Total	200	100
Fruits	50-75	138	69
	75-100	46	23
	100-150	16	8
	Total	200	100
Milk and milk products	100-150	120	60
	150-200	54	27
	200-250	26	13
	Total	200	100
Fats and oils	< 10	46	23
	10-20	96	48
	>20	58	29
	Total	200	100

With regard to the quantity of foods consumed by the selected diabetics majority of them consumed 250 – 300 g of cereals. The pulses were consumed to about 40 – 50g by 51% of selected diabetic females. Greatest part of the selected diabetics consumed 50 – 60g of green leafy vegetables. With regard to vegetable consumption, majority 56% of them had 50 – 75g. Roots and tubers consumption was minimum to 50 – 75g by majority (69 %) of them. With regard to the fruit consumption, greater part (69%) of them consumed a minimum of 50 – 75 g. About 100 – 150 g of milk and milk products were consumed by the majority (60%). Greater part of the selected diabetics consumed the fats to the limit. The fat and oil consumption was very minimum with 10 – 20g by majority (48%). The imbalance in the nutrient intake and food consumption could be mainly due to poor eating habits, life style changes, lack of nutrition knowledge, faulty dietary habits and improper selection of food groups. Hence proper nutrition education and diet counselling are essential for the management of diabetes.

4. Consumption Pattern of Fats and Oils

Table IV reveals the consumption pattern of fats and oils among the selected diabetics.

Table IV: Consumption Pattern of Fats and Oils by Selected Diabetics

Type of Oil*	Female (n=200)	
	No.	%
Refined oil	134	67
Sunflower oil	110	55
Groundnut oil	70	35
Gingelly oil	54	27
Rice bran oil	16	8
Butter, ghee and vanaspathi	18	9

* Multiple Response

It is observed that a majority 67 % of the selected diabetics consumed refined oil. Sunflower oil was used by 55 per cent, groundnut oil by 35 per cent, gingelly oil by 27 per cent, rice bran oil by 8 per cent and butter, ghee and vanaspathi by a minority of 9 per cent. Franz (2007) stated that high dietary fat intake especially saturated fat contribute to the development of diabetes. The present study revealed that a majority of diabetics used sunflower oil containing polyunsaturated fatty acids but intake of coconut oil containing monounsaturated fatty acids is not observed among the selected diabetics.

5. Consumption Pattern of Fast Foods and Fried Items

Details regarding the consumption pattern of fast foods and fried items by the selected diabetics are given in Table V.

Table V: Consumption Pattern of Fast Foods and Fried Items by Selected Diabetics

Type of Food	Frequency	Female (n=200)	
		No.	%
Fast Foods	Daily	8	4
	Weekly twice	4	2
	Weekly once	66	33
	Once in two weeks	122	61
Fried Items	Daily	50	25
	Weekly twice	68	34
	Weekly once	40	20
	Once in two weeks	42	21

Regarding the fast foods consumption, a majority of 61 % consumed them once in two weeks. Fried items were consumed by a majority of 34 per cent weekly twice and a minority of 20 per cent preferred them weekly once. Rojarani (2000) revealed that there is a marked increase in the intake of fat in the form of fried, refined and processed foods in urban population. The present study also revealed a trend towards consumption of fast foods and fried items among a portion of the diabetics.

C. Lifestyle Practices of Selected Diabetics

1. Exercise Pattern

The details regarding the exercise pattern of the selected diabetics are presented in Table VI.

Table VI: Exercise Pattern of the Selected Diabetics

Exercise	Female (n=200)	
	No.	%
Exercise performed	104	52
Not preferred	96	48
Type of exercise*		
Walking	114	57
Gardening	28	14
Household work	160	80
Yoga	42	21

* Multiple Response

It is observed that a majority of 52 per cent females among the selected diabetics had the habit of performing exercise regularly. With regard to the type of exercise, majority (80 %) of female diabetics were engaged in household work and neglected other active exercises. 57 per cent practiced walking and 14 per cent of female diabetics preferred gardening and 21 per cent preferred yoga. According to Kruk (2007) physical activity reduces chronic diseases such as cardiovascular, heart, diabetes, cancer, obesity, osteoporosis, stress and depression.

2. Personal Habits

Details regarding the personal habits of the selected diabetics are presented in Table VII.

Table VII: Personal Habits of the Selected Diabetics

Habits	Female (n= 200)	
	No.	%
Chewing betel leaves / tobacco/ pan masala	56	28
No such chewing habits	144	72
Coffee/ tea consumption	128	64
Health drinks	20	10
No preference	52	26

Regarding the habit of chewing betel leaves / tobacco / pan masala a majority of 72 per cent did not have that habit. Rapid changes in diet and lifestyle increases tobacco consumption which appeared to be strongly associated with mortality due to cardiovascular and cancer in the middle income category (Singh *et al.*, 2007). A Majority of 64% of the selected diabetics had the habit of coffee / tea consumption. A minority of 10 % preferred the consumption of health drinks and 26 % did not prefer any beverage.

D. History of Diabetes

1. Family History of Diabetes

The details regarding the family history of diabetes are presented in Table VIII.

Table VIII: Family History of Diabetes of the Selected Diabetics

Particulars	Female (n= 200)	
	No.	%
Relationship		
Father	76	38
Mother	42	21
Grand father	22	11
Grand mother	34	17
Other relatives	18	9
None	8	4
Duration (years)		
1 – 5	62	31
5 – 10	98	49
10 – 15	32	16
15 – 20	8	4
Age of Onset (years)		
35 – 40	54	27
40 – 45	82	41
45 – 50	58	29
> 50	6	3

Among the selected diabetics, a majority of them had the family history of diabetes as diabetic father (38%) and diabetic mother (21%). A minority of 4 per cent only did not have the family history of diabetes. Gupta (2007) revealed that prosperity to become a diabetic is higher among Indians. There is a strong association between heredity and diabetes mellitus. Stronger the family history, greater is the tendency for developing diabetes (Sanjay and Jali, 2006).

Among the selected diabetics a majority of 49 per cent of them were suffering from the diabetic condition for the past 5-10 years followed by 31 per cent for the past 1 - 5 years. A minority of 4 per cent were suffering for the past 15 - 20 years. A majority (41%) of the selected diabetics had the onset of diabetes at the age of 40 - 45 years and a lesser percentage of 3 had diabetes after the age of 50 years. The present findings are similar to the National Urban Diabetes Survey in India which showed that more than 50 per cent of diabetes cases had the onset below the age of 50 years (Vijay, 2005).

4. Type of Treatment of Diabetes

The details regarding the type of treatment of diabetes taken by the selected diabetics are given in Table IX.

Table IX: Type of Treatment Undertaken by the Selected diabetics

Type of Treatment	Female (n = 200)	
	No.	%
Allopathy	120	60
Ayurveda	22	11
Siddha	14	7
Naturopathy	20	10
None	24	12

Among the selected diabetics a majority of 60 per cent underwent allopathic treatment. It is distressing to note that 12 per cent of the selected diabetics did not take any type of treatment for control of diabetes.

5. Clinical Symptoms and Complications of Diabetes

The common clinical symptoms and complications reported by the selected diabetics are depicted in Table X

Table X: Clinical Symptoms Reported by the Selected Diabetics

Symptoms *	Female (n = 200)	
	No.	%
Polyuria	76	38
Polyphagia	54	27
Polydipsia	40	20
Visual disturbance	110	55
Delayed wound healing	32	16
Tiredness / fatigue	62	31
Leg pain / back pain	58	29

Type of Complication *	No.	%
Hypertension	110	55
Diabetic retinopathy	30	15
Diabetic nephropathy	22	11
Diabetic neuropathy	10	5
Diabetic foot disease	40	20
Cardiovascular disease	42	21
Kidney disease	36	18
None	24	12

*** Multiple Response**

A majority of 55 per cent of the selected diabetics reported the common clinical symptom of visual disturbance. Other symptoms were also reported by the selected diabetics such as polyphagia, polydipsia, delayed wound healing tiredness / fatigue, leg pain / back pain etc. Among the selected diabetics a majority 55 per cent had hypertension. According to American Diabetes Association (2006) people with diabetes are 2 to 4 times likely to have heart disease which is present in 75 per cent of diabetes related deaths (more than 77,000 deaths due to heart disease annually).

Majority of the selected diabetics were prone to some type of complications and peaked by hypertension (55 %). Utpal *et al.*, (2005) reported that foot infection is a common complex and costly problem in persons with diabetes. It is revealed from the present study that 20 per cent of the diabetics had diabetic foot disease.

E. Anthropometric Measurements

The height, weight and BMI of the selected diabetics are presented in Table XI

Table XI: Anthropometric Measurements of the Selected Diabetics

Height (cm)	Female (n=200)	
	No.	%
150 – 160	30	15
161 – 170	124	62
171 – 180	46	23
Weight (kg)		
51 – 60	30	15
61 – 70	104	52
71 – 80	52	26
81 – 90	18	9
BMI Classification (kg/m ²) (WHO, 2004)		
< 18.5 (Underweight)	10	5
18.5 – 24.9 (Normal)	124	62
25.0 – 30.0 (Overweight)	48	24
> 30.0 (Obese)	18	9

It is evident from the table that a majority of 62 per cent of the selected diabetics had a height ranging from 161-170 cm. Among the selected diabetics a majority of them had a body weight of 61 – 70 kg. From the table, it is evident that a majority 62 per cent of females were under the BMI within the normal range. Only a least of 5 per cent were found to be in the underweight category with BMI less than 18.5. There is a direct relationship between the degrees of obesity and the risk of developing type II diabetes and this holds true for adults.

Conclusion

Women pay more attention to the health of her family, leaving them with less time to devote to their own wellbeing. The disease itself may not discriminate on the basis of gender, but when it comes to healthcare for diabetes, women in India find themselves at a shortcoming compared with men. The people are increasing the comfort zone with advent of technology and obviously it increases laziness and reduces physical activity with changing lifestyle and food habits contributing to the higher prevalence lifestyle diseases among women.

With economic development and globalization in India, diet has also changed to increased saturated fats, energy-dense foods and fast foods. Research has found that lack of exercise and unhealthy diet associated with increased risk of diabetes in women. Thus it is alarm to concentrate on health education and intervention programs targeting a healthy diet and physical activity to reduce risk of diabetes and lead a healthy life. The health planners to obtain the area specific information in order to assess the extent of the problem and identify areas for intervention of the disease to chalk out effective plan for the future.

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