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Original Research Article

Dietary pattern among type 2 diabetes in rural area of Mysuru

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ABSTRACT

Background: Type 2 diabetes mellitus is considered one of the most common diseases in the world. It has a complex aetiology that includes both irreversible and reversible risk variables. Diet and its practice, sedentary way of life are the key factors for rapidly rising incidence amongst developing countries. Different methodological approach, to construct their diet patterns and their composition bound to conclusions on healthy patterns for diabetics. The study aimed to assess the dietary pattern among type 2 diabetic patients in rural field practice area of department of community medicine, Suttur, Mysuru.
Methods: The study was conducted at rural primary health center, Suttur, Mysore. 384 patients with type 2 diabetes (having for >1 years) aged between 18-70 years formed the study population. Semi-structured questionnaires were used to obtain data about dietary practices and food frequency questionnaire was used to assess food intake.
Results: Results revealed 70% were illiterates, 47.9% were between 1-3 years duration of diabetes and 97.4% followed both diet and oral medications. All of them consumed 3 meals a day. Dietary practices incorporated due to diabetic state were: cereals (100%) and fruits (166.6%), meat and poultry (200.6%) weekly.
Conclusions: It is one such type of disease which can be prevented at various levels by identifying predictors. Diabetic patients had poor dietary practices and consumed protective foods inadequately. Dietary practices did not change markedly except for reduction in cereals, and fruits.

Keywords: Dietary pattern, Nutritional status, Lifestyle, FFQ, T2DM, Suttur

INTRODUCTION

Type 2 diabetes impacted approximately 462 million people worldwide in 2017, accounting for 6.28 percent of the global population in which 4.4 percent of those aged between 15 to 49 years, 15 percent of them aged 50 to 69 years. Incidence raises to approximately 55 years of age, and the gender distribution is equal.[1] Diabetes has a multifaceted aetiology in India, comprising genetic components as well as environmental variables such as obesity linked to rising living standards, rapidly increasing migration, and lifestyle changes. The studies are also prone to inaccuracy due to the heterogeneity of the Indian population in terms of culture, ethnicity, and socioeconomic conditions, which means that extrapolating regional results to the entire country may result in inaccurate estimations.[2] The disparity in the distribution of health resources between urban and rural areas, and rural poverty may be multi-faceted. Food hardship, illiteracy, inadequate sanitation, and the prevalence of infectious diseases may all play a role, implying that policymakers and local governments are undermining and under prioritizing the emerge of diabetes threat.[3]

Diet and nutrition in type 2 diabetes mellitus

The balance of food, exercise, and prompt medication is the cornerstone of diabetes treatment.[4] The balance of food, exercise, and prompt medication is the cornerstone

of diabetes treatment.[4] While studies have shown the importance of a healthy diet in achieving effective glycemic control, diabetic patients should consume foods rich in fibre, such as legumes, whole grains, vegetables, and fruits, while avoiding sweets as well as fats.[5,6] A high consumption of fruits and vegetables has been implicated in decrease of risk and effective diabetes control.[6,7] It is universally recognized that limiting dietary carbohydrate results in a faster reduction in postprandial and overall glucose levels.[8-9] In diabetes self-care, diet advice is considered essential. However, it has been observed that the majority of diabetic patients experience difficulty in identifying the necessary quality and quantity of food to eat, and that many are ignorant of the importance of diet in maintaining glycemic control.[10-12] It is necessary to establish and execute effective nutrition counselling practises for diabetes patients about information on the qualitative and quantitative aspects of diet and meal patterns. Such information would make it easier for health care practitioners to teach patients how to adhere to their diets. Simultaneously, focus should be placed in establishing environments that promote a healthy lifestyle. In India, diabetes awareness and education are truly lacking. As a result, this study was carried out with the goal of examining the dietary habits and nutritional condition of type 2 diabetes patients.

METHODS

A cross sectional study was conducted over a period of 6 months in rural field practice area of JSS medical College, Suttur, Mysuru. Sample size was calculated by assuming 57.8% of people consuming 4-6 meals per day and considering absolute precision of 5%. The sample came out to be 374.[13] A total of 384 subjects were interviewed, in the age group of 18 years and above who are registered in rural primary health centre Suttur and subjects with type 2 diabetes diagnosed more than 1 year. While patients who are seriously ill, pregnant and lactating women were excluded from the study. The questionnaire included questions on demographic characteristics (age, education, gender, marital status, religion, duration of diabetes), detailed information about dietary practices and lifestyle factors. This included type of diet, regularity of meal timing, frequency of meals consumed, meal skipping. Information on qualitative and quantitative food intake was obtained using standard food frequency questionnaire (FFQ). Qualitative data elicited as frequency of intake of various foods items as daily, weekly, monthly or never. Food intake was reported as portion size consumed per day, per week or per month and described interms of grams. Standard measures of cup, glass, and spoons- were used to quantify consumption. Foods consumed by respondents were grouped under cereals and millets, pulses, milk and milk products, green leafy vegetables, other vegetables, fruits, eggs, meat and poultry, fish. Food intake data was reported average intake per day as raw measures. Cooked foods were converted into raw equivalents as per National institute of nutrition (NIN) guidelines. Rice ½ cup=1 portion raw rice (30 gm), dhal ½ cup=⅔ portion raw dhal (20 gm), milk ½ cup= 1 portion milk (100 ml), cooked vegetables ½ cup=100 gm raw vegetables, fruit 100 gm fruit or 1 medium size fruit=1 portion, meat/chicken/fish 50 gm=1 portion.[14]

RESULTS

Demographic characteristics of the participants are presented in (Table 1). Among the 384 participants, 165 (43%) were male and 219 (57%) were female. Majority of them were in the age group of 31 to 50 years (51.6%) and most of them belonged to Hindu religion (99.7%), 70.3% were illiterate, 55.5% of subjects belonged to Class V Socio economic status, 47.9% were having diabetes between 1 to 3 years and 97.4% were on diet and oral treatment.

Table 1: Demographic characteristics and duration of diabetes (n=384).

Variable	Groups	N	%
Gender	Male	165	43
	Female	219	57
Age (years)	18-30	4	1
	31-50	198	51.6
	51-70	146	38
	>70	36	9.4
Education	Illiterate	270	70.3
	Lower primary	44	11.5
	Higher primary	24	6.3
	Preuniversity/diploma	12	3.1
	Graduation	32	8.3
	Postgraduation	2	0.5
Religion	Hindu	383	99.7
	Christian	1	0.3
Socio economic status	Class I	15	3.9
	Class II	81	21.1
	Class III	23	6.0
	Class IV	52	13.5
	Class V	213	55.5
Duration of diabetes (years)	1-3	184	47.9
	3-5	147	38.3
	5-7	45	11.7
	>7	8	2.1
Diabetes treatment	Diet and oral	374	97.4
	Diet and insulin	4	1
	Diet	6	1.6

Dietary practices like diet type, skipping meal, eating junk food, regularity of meal timings and lifestyle factors were assessed (Table 2). Among the participants 78.4% were having mixed diet while a small percentage (21.6%) was having vegetarian diet. About 100% consumed small frequent (3 times/day) meals, 74.2% participants reported they did not skip meals before the onset of diabetes while 98.4% participants reported they did not skip meals after developing diabetes. Although, eating everyday outside

home was practiced by only 0.3% participants, 72.9% mentioned they never eat outside home. Sunflower oil was the widely accepted (80.5%) cooking oil among the participants and nearly 19.5% subjects used sunflower oil along with other oil for cooking.

Table 2: Dietary pattern and food habits of study participants.

Practices	Variables		%	N
Diet preferred	Vegetarian		21.6	83
	Mixed		78.4	301
No. of meal per day	3		100	384
Skipping meals	Before developing diabetes	Yes	25.8	99
		No	74.2	285
	After developing diabetes	Yes	1.6	6
		No	98.4	378
Regularity of meal time	Yes		100	384
	No		-	-
Frequency of junk food consumption	Daily		0.3	1
	Once a week		4.7	18
	Rarely		22.1	85
	Never		72.9	280
Type of oil used	Sunflower		80.5	309
	Sunflower+any other oil		19.5	75

The frequency and usual intake of foods from various food categories is shown in (Table 3). Cereal being the staple food was consumed by all the participant, usual intake of cereal was 307.11 gm per day, pulses 32.06 gm were included in the daily diet by majority of the participants, milk (in the form of tea, coffee also) was consumed daily by 11.4% participants having average intake of 100.5 ml per day. 98.7% participants used to consume 181.5 gm green leafy vegetables (GLV) weekly where as other vegetables were consumed as 166 gm weekly by 97.1% of them. On the other hand 3.1% participants consumed 100 gm of fruits daily followed by 2.6% for 166.6 gm weekly and 23.7% for 108.8 gm monthly. 1.3% participants consumed egg daily and 7.3% consumed monthly, with usual intake 50gm and 100gm respectively. While 78.4%participants consumed meat & poultry weekly, their usual intakes were 200.6 grams where as fish was consumed monthly by 27.9% participants with usual intake was 30.2 grams.

DISCUSSION

Diabetes management is complicated, and it demands health-risk-reduction methods in addition to blood sugar control.[15,16] Healthy eating i.e. limiting the quantity of high-sugar meals and portion sizes, lowering high-fat foods, eating regularly, eating greater portions of vegetables, limiting particular carbohydrate items, and avoiding fast-food have all shown help in maintaining low HbA1c readings.[17,18] The present study points to dietary practices among diabetic patients, eating pattern, frequency of eating and portion size. Certain dietary practices found to be beneficial among the participants like consumption of 3 meals a day (100%), maintaining regular meal time (100%) and only a small percentage of the participants eat outside home (0.3% daily, 4.7% once a week). Although the maximum proportion of diabetic patients followed better practices. Further considering regularity of exercise, only 2.1% prefer doing exercise daily. In a study conducted by Kumar et al reported among 230 participants only 33.91% of diabetic patients perform physical exercise regularly.[19]

Table 3: Usual intakes (portion size) of different foods and their frequency of consumption by the study population.

Food items	Variables	Daily	Weekly	Monthly	Never
Cereals and Millets	% of participants	100	-	-	-
	Avg. intake/day (g)	307.11			
Pulses	% of participants	100	-	-	-
	Avg. intake/day (g)	32.06	-	-	-
Milk	% of participants	11.4	-	-	-
	Avg. intake/day (ml)	100.5	-	-	-
Green leafy vegetables	% of participants	1.3	98.7	-	-
	Avg. intake/day (g)	75	181.5	-	-
Other vegetables	% of participants	2.9	97.1	-	-
	Avg. intake/day (g)	88.6	166	-	-
Fruits	% of participants	3.1	2.6	23.7	70.6
	Avg. intake/day (g)	100	166.6	108.8	
Eggs	% of participants	1.3	69.8	7.3	21.6
	Avg. intake/day (g)	50	90	100	
Meat and poultry	% of participants	-	78.4	21.6	-
	Avg. intake/day (g)	-	200.6	-	-
Fish	% of participants	-	-	27.9	72.1
	Avg. intake/day (g)	-	-	30.2	-

Current study results indicates inadequate dietary intakes, protective foods were eaten in significantly lower quantities than recommended portion sizes. Based on the normal intakes, it is noticeable that pulses and milk and milk products were poorly consumed but protein-rich meals such as legumes and dairy products shown their benefit in glycemic control and insulin secretion among diabetics. Our results indicates inadequate dietary intakes, protective foods were eaten in significantly lower quantities than recommended portion sizes. Based on the normal intakes, it is noticeable that pulses and milk and milk products were poorly consumed but protein-rich meals such as legumes and dairy products shown their benefit in glycemic control and insulin secretion among diabetics.[20,21] According to National nutrition guidelines, a healthy adult should have 1 portion of green leafy vegetables, 2 portions of other vegetables and 1 portion of fruit on average daily. In additional intake of low glycemic index vegetables and fruits has proven to improve glucose control in diabetics.[22,23] Participants consumed 180.4 gm green leafy vegetables, 163.8 gm other vegetables and 33.5 gm of fruits weekly. These results in accordance with NIN guidelines reports to have low intake of vegetable and fruit among population. Intake of cereal (307.11 gm), pulses (32.06 gm) and milk (100.5 ml) were reduced compared to usual intake by adult healthy person.[14] Reinforcing the information on nutrition, by allowing them to listen to or participate in a discussion about diabetes nutrition diet may encourage them to adopt good practices.

Limitations

Limitation of current study was that the method adopted was cross sectional study, by doing nutritional intervention a longitudinal or cohort studies will be advantageous to understand magnitude and trend of nutritional status.

CONCLUSION

According to the results of the present study, a significant chunk of the population consumes insufficient amounts of nutritious foods. Certain eating habits were evident, such as a decline in cereal, milk, and fruit consumption. However, the majority of the individuals maintained inadequate eating habits prior to the onset of diabetes. This means that a large majority of individuals are at risk of experiencing consequences. It may be fair to suggest that knowledge of community eating practices should be available in order to develop nutrition education programmes that are adapted to the needs of each individual.

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