Research Paper   **Home Science**

Impact of Dietary Counseling in Diabetes Control

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ABSTRACT

The survey conducted by Indian Council of Medical Research at six centers, covering a population of 35,000 has shown that the disease prevailed in 2.3 percent of the urban and 1.5 percent of the rural population. There are mainly three types of diabetes - diabetes I, diabetes II and gestational diabetes. Causes of diabetes are Heredity, Obesity, Incorrect dietary habits. it was thought worth while to undertake the study of diabetic patients with the following objectives To study the dietary habits and nutritional intake of diabetic patients. To undertake the anthropometric and clinical examinations of diabetic patients. To prepare diabetes control, nutritional practice inventory and undertake counseling of selected diabetic patients. The present study was concerned with assessment of impact of dietary counseling in diabetes control, hence Before - After one Group Experimental Design was used. A total of 45 (both male and female) diabetic patients were selected randomly from those patients who had visited Dr. Thotes hospital during the period of October 2010 - November, 2010. The intake of carbohydrates and fats was noted to be in excess. It is advisable that the diabetic patients should be made aware about low calorie and low fat content foods and persuaded to make regular use of these foods. Dietary counseling was found to be significantly effective. Such counseling should therefore, form an integral part of providing counseling to diabetic patients through diet consultants, public health workers and mass media.

Keywords : Diabetes control, Dietary counseling.

Introduction:

The percentage of people affected by diabetes is increasing day by day, by the turn of this century there will be around 20 million people with diabetes in India. The survey conducted by Indian Council of Medical Research at six centers, covering a population of 35,000 has shown that the disease prevailed in 2.3 percent of the urban and 1.5 percent of the rural population

There are mainly three types of diabetes

diabetes I, diabetes II and gestational diabetes

Causes of diabetes are Heredity, Obesity, Incorrect dietary habits.

Diabetes being a serious disorder, it was thought worth while to undertake the study of diabetic patients with the following objectives.

To study the dietary habits and nutritional intake of diabetic patients.

To undertake the anthropometric and clinical examinations of diabetic patients.

To prepare diabetes control, nutritional practice inventory and undertake counseling of selected diabetic patients.

Methodology

The present study was concerned with assessment of impact of dietary counseling in diabetes control, hence Before - After one Group Experimental Design was used.

A total of 45 (both male and female) diabetic patients were selected randomly from those patients who had visited Dr. Thotes hospital during the period of October 2010 - November, 2010.

The selected diabetic patients were imparted proper guidance through counseling with regard to nutritional practices and exercise to control increased blood sugar levels.

An observation schedule for anthropometric measurements, biochemical parameters and clinical examination was also developed to record data on selected patients.

They were given diet counseling while taking the treatment.

The data pertaining to diet pattern, anthropometric measurements and biochemical examination were collected before counseling of the selected patients.

The data pertaining to the knowledge about nutritional practices, use of nutritional practices, nutritional intake and clinical examination were collected at two point of time, that is, before counseling and one month after counseling for ascertaining the impact of diet counseling.

Dietary Pattern

Dietary pattern has been defined as the frequency of intake of food during the whole day and was categorized as follows.

Sr. No.	Category
1	Lunch + Dinner
2	Breakfast +Lunch+Dinner
3	Lunch+Snacks+Dinner
4	Breakfast+Lunch+Snacks+Dinner

Adoption Of Nutritional Practices

The adoption of nutritional practices was defined as the actual use of nutritional practices. To ascertain the use of nutritional practices, 12 questions related to the nutritional practices such as meal planning, combination foods, protein rich foods, low calorie foods etc. were developed for the administration to the respondents. These questions were administered to the selected diabetic patients.

The answers were categorized as regularly, sometimes and never and scored as three, two and one. The respondents were categorized in three categories of nutritional practices adoption by dividing the range of expected adoption score into three intervals and considering the actually obtained scores were considered.

Sr. No.	Category	Range Score
1	Low	Up to 20
2	Medium	21 to 28
3	High	Above 28

Nutritional Intake

Nutritional intake referred to the actual intake of various food ingredients by the respondents in a whole day. For working out the nutritional intake the quantity of various food stuffs consumed by the individual respondents in a day was ascertained. From the food intake the quantity of intake of various ingredients namely carbohydrates, proteins, fats and fibre were worked out. And calories calculated. Taking into account the recommended nutritional intake and the actual nutritional intake the respondent were categorized in three groups.

Sr No.	Food ingredients and categories	Range of recommended intake
1	**Calories**	
	Less than recommended	Less than 1400 Calories
	As Recommended	1401 to 1600 calories
	More than recommended	More than 1600 Calories
2	**Carbohydrates**	
	Less than recommended	Less than 210 gm.
	Recommended	211 gm to 240 gm
	More than recommended	More than 240 gm.
3	**Proteins**	
	Less than recommended	Less than 58 gm.
	As Recommended	59 to 68 gm.
	More than recommended	More than 68 gm.
4	**Fats**	
	Less than recommended	Less than 28 gm.
	As Recommended	29 to 32 gm.
	More than recommended	More than 32 gm.
5	**Fibre**	
	Less than recommended	Less than 30 gm.
	As Recommended	31 gm to 40 gm
	More than recommended	More than 40 gm

Bio-chemical Assessment

The pathological report of the sample of patients was examined for information about lipid profile and blood sugar and their categorization was made.

Sr. No.	Category	Range of values
1	**Fasting blood sugar**	
	Less than normal	Less than 70 mg%
	Normal	71mg% to 110mg%
	Above normal	More than 110mg%
2	**Post-meal blood sugar**	
	Normal	Up to 140 mg%
	Above normal	More than 140 mg%
3	**Lipid profile**	
i	VLDL cholesterol	
	Normal	Up to 130 mg%
	Above normal	More than 130 mg%
ii	HDL cholesterol	
	Less than normal	Less than 30 mg%
	Normal	31 mg% to 60mg%
	Above normal	More than 60 mg%
iii	Triglycerides	
	Less than normal	Less than 30 mg%
	Normal	31mg% to 150 mg%
	Above normal	More than 150mg%
iv	Cholesterol	
	Less than normal	Less than 130 mg%
	Normal	131mg% to 200mg%
	Above normal	More than 200mg%

To find out the impact of diet counseling on diabetic patients, the mean score of knowledge, adoption of nutritional practices and total calorie intake before and after counseling were tested for difference with the help of 't' test.

The following formula was used to work out 't' values

$$t = \frac{d.\sqrt{n}}{s}$$

The significance of the value of 't' was ascertained with the table value at (n-1) degrees of freedom.

Results And Discussion

Nutritional Intake

The factual information about the food items and their quantify consumed by the diabetic patients in a day was collected. From that information the intake of food ingredients namely, carbohydrates, proteins, fats and fibre were worked out and calories calculated. The diabetic patients were divided into three groups depending on their intake that is, less than recommended, as recommended and more than recommended. (Matthias Schulze et al. 2005 and Juma Al-Kabi. et al., 2008).

The distribution of the diabetic patients in Table 1 before counseling point out that majority of them were observed to have less than recommended quantity of intake of total calories (66.67%), carbohydrates (80%), proteins (100%) and fibre (88.89%). They were however found to be consuming excess quantity of fats (93.33%). The hypothesis that the nutritional intake of diabetic patients is normal has therefore to be rejected.

One month after counseling it was again noted that although majority of the diabetic patients were in less than recommended quantity of intake of total calories (64.44%), carbohydrates (64.44%), proteins (84.44%) fibre (62.22%) and excess consumption of fat (86.67%) but the percentages have shown further decrease. Further, the percentage of diabetic patients in normal intake category in respect of total calories, carbohydrates, proteins, fats and fibre has shown an increasing trend to near about one-third. This could definitely be attributed to the effect of diet counseling.

Table 1 : Distribution of diabetic patients on nutritional intake

Sr. No.	Nutrition and Categories	Before counseling		After counseling	
		Frequency	Percent	Frequency	Percent
1	**Calories**				
	Less than Recommended	30	66.67	26	64.44
	Recommended	9	20.00	16	35.56
	More than Recommended	6	13.33	0	0.00
2	**Carbohydrate**				
	Less than Recommended	36	80.00	29	64.44
	Recommended	4	8.89	14	31.11
	More than Recommended	5	11.11	2	4.44
3	**Protein**				
	Less than Recommended	45	100.00	38	84.44
	Recommended	0	0.00	7	15.56
	More than Recommended	0	0.00	0	0.00
4	**Fats**				
	Less than Recommended	0	0.00	0.	0.00
	Recommended	3	6.67	6	13.33
	More than Recommended	42	93.33	39	86.67
5	**Fibre**				
	Less than Recommended	40	88.89	28	62.22
	Recommended	5	1.11	17	37.78
	More than Recommended	0	0.00	0	0.00

Biochemical Examination

The biochemical reports of diabetic patients were examined before and after counseling. It included blood glucose fasting and post meal and urine sugar. The results of biochemical reports are depicted in Table 2. (Ozlem Vcan and Nimet Ovayolu, 2010; Manikant Singla et al., 2009).

FASTING BLOOD GLUCOSE

The fasting blood glucose contents in Table 2 indicated that 55.56 percent of diabetic patients were in above normal range before counseling. It was followed by 44.44 percent of diabetic patients who had fasting blood glucose in normal range.

Regarding fasting blood glucose contents after counseling it was seen that 48.89 percent of diabetic patients were in normal category. But 51.11 percent of diabetic patients had above normal fasting blood glucose contents.

The above result tells that there had been a positive effect of counseling of diabetic patients as the percentage of patients in normal range of fasting glucose was increased.

Post Meal Blood Glucose

From Table 2 it could be observed that before counseling the post meal blood glucose level in 80 percent of diabetic patients falls in ' above normal ' blood glucose level. It was followed by 20 percent of diabetic patient who had normal post meal blood glucose level.

Table 2 : Distribution of diabetic patients on fasting, post-meal blood sugar and urine sugar content before and after counseling.

Sr. No.	Particulars and categories	Before counseling		After counseling	
		Frequency	Percent	Frequency	Percent
1	Fasting				
	Less than normal	0	0.00	0	0.00
	Normal	20	44.44	22	48.89
	Above normal	25	55.56	23	51.11
2	Post-meal				
	Normal	9	20.00	15	33.33
	Above normal	36	80.00	30	66.67
3	Urine sugar				
	Normal	10	22.22	10	22.22
	1%	17	37.78	17	37.78
	2%	18	40.00	18	40.00

Urine Sugar

The assessment of diabetic patients with respect to urine sugar before and after diet counseling revealed that, in 40 percent the urine contained two percent sugar. As many as 37-78 percent patients had one percent sugar percent in their urine. Only 22.22 percent patients had urine sugar in normal range.

Impact Of Diet Counseling

In accordance with the objective of the study efforts were made to asses the impact of diet counseling on knowledge about nutritional practices, food patterns and dietary practices, adoption of nutritional practices and nutritional intake. (Seung Kim and Jeong-Ah Oh, 2003; Lucie Nields et al., 2008 and Ulla Toft et al., 2008).

Table 3 : Testing of mean differences on knowledge, adoption, food pattern and nutritional intake before-after diet counseling of diabetic patients.

Sr. No.	Parameter	Mean values	
		Before counseling	After counseling
1	Knowledge about nutritional practices	12.20	19.96**
2	Food pattern and dietary practices	74.33	73.11**
3	Adoption of nutritional practices	21.22	24.35 **
4	Nutritional Intake		
	Carbohydrates	172.62	179.38 [N.S.]
	Proteins	30.00	35.12 **
	Fats	54.00	41.51 **
	Fibre	20.46	26.52 **

** Significant at 0.01 level of probability.
NS - Non-significant

The result of testing of mean differences depicted in Table 3 clearly speaks out that the mean knowledge of nutritional practices possessed by diabetic patients before counseling (x = 12.20) was less than the same after a lapse of one-month after counseling (x = 19.56). The change (increase) was positive and significant. The hypothesis that nutritional counseling of diabetic patients has a positive effect on knowledge is therefore proved.

Regarding food patterns and dietary practices there has been a decrease in mean value form 74.33 before counseling to 73.11 after counseling. The difference between the mean values was found to be significant. It shows that there had been a desirable change in food pattern and practices followed by diabetic patients; due to dietary counseling.

So far as the adoption of recommended nutritional practices by the diabetic patients is concerned it is apparent from the mean values that the mean value obtained after counseling was higher (x = 24.35) than that before counseling (x = 21.12) and the difference was observed to be significant. The effect of dietary counseling was therefore found to be significant indicating a positive trend in respect of adoption of recommended dietary practices. This leads to the acceptance of the hypothesis that the nutritional counseling of diabetic patients has a positive effect on adoption of recommended dietary practices.

The effect of dietary counseling on intake of various nutrients shows that there had been a desirable and positive effect on intake of proteins, fats and fibres. The intake of proteins and fibres shows an increase and the intake of fats shows a decrease as evident from the values of means before and after counseling. The difference was noted to be significant. However in respect of intake of carbohydrates there was no significant effect.

The above findings indicate a positive and significant effect of dietary counseling on knowledge, food pattern and dietary practices, adoption of nutritional practices and the intake of proteins, fats and fibers by diabetic patients and indicate a need for such counseling of diabetic patients with a view to keep in control this geometrically increasing disease in the contemporary society.

Conclusions

The intake of carbohydrates and fats was noted to be in excess. It is advisable that the diabetic patients should be made aware about low calorie and low fat content foods and persuaded to make regular use of these foods.

Dietary counseling was found to be significantly effective. Such counseling should therefore, form an integral part of providing counseling to diabetic patients through diet consultants, public health workers and mass media.

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