

Group Counseling as an Intervention in Management and Alleviation of Selected Modifiable Risk Factors of Diabetes Mellitus

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ABSTRACT

Background and Objectives: Modifiable risk factors management is crucial for progression of the disease complications of diabetes. The study investigated impact of Holistic counseling on selected anthropometric measurements and on symptoms of the patients with diabetic mellitus (T2DM).

Materials and Methods: The study assessed the impact of counseling using a pre and post test experimental design. The subjects were randomized into two groups; those who were willing to attend counseling with periodic follow up (Experimental Group), and those who were not willing to attend counseling (Control Group). A total of 160 type 2 diabetic patients in the age group of 40-70 years were registered in the study and randomized into experimental and control groups. Patients in the experimental group received counseling at every weekend for twelve weeks. The experimental group received a twelve week educational program, while the control group did not. A structured and pretested questionnaire was administered to elicit information from the subjects. Outcome of counseling was assessed by measuring selected anthropometric parameters and symptoms of diabetes and statistically analyzed using one way ANCOVA using SPSS statistical software, version 15.0 for windows evaluation.

Results: The twelve week counseling program brought a significant reduction in W/H ratio ($p < 0.05$) of the subjects in the experimental group with a marginal change in BMI ($P > 0.05$). Counseling proved to be effective as there was significant improvement in symptoms of hyperglycemia, polyuria, mental stress and tiredness ($p < 0.05$).

Conclusion: In culmination it may be seen that patient counseling certainly upgrades the patient's ability to cope with their disease and ultimately manage disease.

Keywords: Counseling; Diabetes mellitus; Hyperglycemia; Modifiable risk factors;

BACKGROUND

Diabetes mellitus is a serious metabolic disease, affecting people of all geographic, ethnic or racial origin and its prevalence is increasing globally. ^[1] Diabetes mellitus is a chronic disease with one of the highest social and healthcare

costs and is associated with a 3-fold to 4-fold increment in cardiovascular morbidity and mortality. ^[2] Diabetes mellitus increases the risk for coronary heart diseases 2-4 times and other sclerosis is rapidly progressive. We know that a number of risk factors are associated with development of

T2DM. In an article current epidemiological evidence for potentially modifiable determinants of T2DM, including obesity, body fat distribution, physical activities and dietary factors was reviewed. [3] A study reported that both overall and abdominal obesity were also strongly related to increased risk of T2DM in a German population of 6021 men and women aged between 35 and 74 years, with the highest risk reported in those participants with a high BMI in combination with a high WC and high waist hip ratio. [4] Hence a large number of cases of T2DM may theoretically be preventable. Therefore self management becomes utmost important in the management of diabetes. This study was undertaken with the objective to make diabetics aware and educate which will enable them to manage the disease.

METHODOLOGY

STUDY DESIGN: This study was an experimental study with a pre-test, post-test design with a control group. The study was designed to assess the effect of periodic holistic counseling on the selected anthropometric parameters and symptoms manifested in diabetic subjects that are considered as modifiable risk factors of type 2 diabetes mellitus. Counseling module was prepared with the help of a diabetes educator so that counseling sessions on all the aspects of diabetes management may be organized. The counseling module mainly focused on physical activity, nutrition and lifestyle.

STUDY PROCEDURE:

The study was conducted between April and June 2018 in the diabetic clinic of Jiwaji University, Gwalior, Madhya Pradesh India. One hundred and sixty subjects of both genders in the age group of 40-70 years were selected for the study. Majority of the subjects were diagnosed as diabetics for more than five years ago and living a sedentary life. These subjects were registered in the diabetic clinic run at the health center of jiwaji University, Gwalior Madhya Pradesh India. All the subjects were explained objectives and purpose of the study. The study registered

only the subjects who were willing to participate in the intervention program. Based on their willingness, they were assigned to two groups that is experimental group and control group, each comprising of eighty subjects. Subjects in experimental groups received holistic counseling once in a week for three months and subjects in the control group did not receive any counseling.

ETHICAL CONSIDERATION: Ethical approval was obtained from the institutional ethics committee for human research subjects (JU/IHEC/2013-A-20). Study objectives and data collection procedures were fully explained to the subjects prior to their participation, and they signed informed consent forms to indicate their willingness to participate. Code numbers were used to protect participants' privacy, and data were kept confidential.

MATERIALS

One hundred and sixty adult subjects with type 2 diabetic mellitus who fulfilled the inclusion criteria were selected for the study. Eighty subjects were assigned to one of the following two groups. The tools used in this study included demographic and modifiable risk factors questionnaire. BMI, W/H Ratio, fasting and postprandial blood glucose levels were measured at baseline and at the end of the study as these were considered important markers. Correspondingly symptoms reported by majority of the subjects were also recorded before and after completion of intervention program.

EXPERIMENTAL GROUP: Subjects who were willing to attend once in a week for three months holistic counseling session with periodic follow up.

CONTROL GROUP: Subjects who were not willing to attend counseling sessions once in a week for three months but take part in pre and post follow up.

Table showing the sample size of the subjects (diabetics) of the two groups chosen: one group who was exposed to three month counseling (experimental) and the other who had not (control)

Between-Subjects Factors

		Value Label	N
Group	1.00	Experimental	83
	2.00	Control	83

TOOLS USED FOR DATA COLLECTION

1-QUESTIONNAIRE METHOD: A structured and pretested questionnaire was administered to elicit information from the subjects regarding age, family history of diabetes, occupation, socio-economic status, personal habits like alcohol consumption and smoking, physical activity as well as information about their dietary pattern and symptoms of diabetes. The subjects were interviewed by the investigator and the response was recorded. The scores of the patients were taken initially and after three month interval.

2-ANTHROPOMETRIC MEASUREMENTS:

HEIGHT: The height was recorded using a stadiometer. The subjects were requested to remove their foot wear and stand with heel and head against the stadiometer and the heights were recorded to the nearest 0.1 cm.

BODY WEIGHT: A weighing scale was used for measuring body weights of the subjects. The subjects were requested to stand on the instrument bare foot and weight was recorded to the nearest 0.5 kg.

BODY MASS INDEX (QUATELETS INDEX):

Body mass index (BMI) and waist hip ratio (WHR) are the most widely used measures to define obesity and predict its complications, such as diabetes mellitus (DM) and hypertension. The relationship between excess weight and diseases has been recognized over time. [5]

Body Mass Index = Weight in (Kg)/Height in (Mt²)

WHR is ratio of waist to hip circumference

DATA ANALYSIS: Data analysis was carried out using one way ANCOVA, employing SPSS statistical software, version 15.0 for windows evaluation.

RESULTS

Body Mass Index

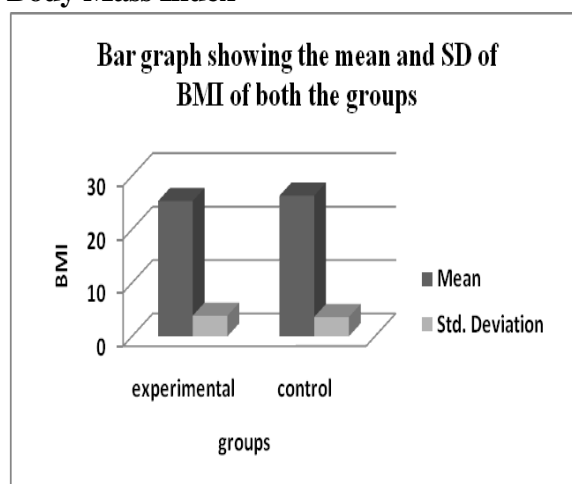


Table No 1: Summary of one way ANCOVA of final scores of BMI of both the groups, considering the pre scores of BMI as co variate.

Tests of Between-Subjects Effects

Dependent Variable: BMI POST

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Group	20.754	1	20.754	1.853	.175
Error	1814.318	162	11.199		
Total	112250.309	165			
Corrected Total	2336.618	164			

WAIST HIP RATIO

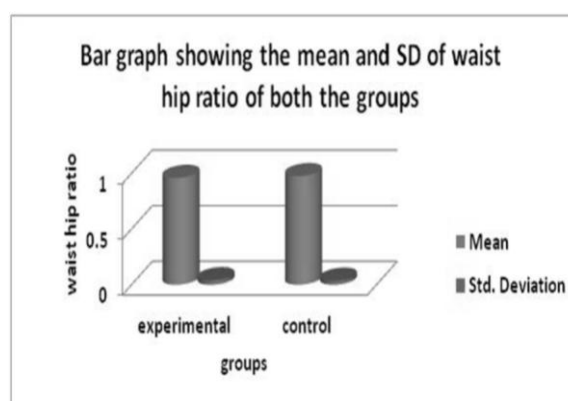


TABLE 2: Summary of one way ANCOVA of final scores of waist hip ratio of both the groups, considering the pre scores of waist hip ratio as co variate.

Tests of Between-Subjects Effects

Dependent Variable: Waist Hip Ratio post

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Group	.011	1	.011	7.407	.007
Error	.234	162	.001		
Total	154.332	165			
Corrected Total	.245	164			

SYMPTOMS OF DIABETES

Table 3: showing the measures of descriptive statistics mean and SD of post scores of selected modifiable risk factors of diabetes of both the groups.

Symptoms observed	Control Group (N=83)		Experimental Group (N=83)	
	Mean	SD	Mean	SD
Blurry vision	.3735	.48667	.1807	.38713
Tiredness	.4940	.50300	.3253	.47134
Mental stress	.2410	.43027	.3373	.47568
Hyperglycemia	.0602	.23938	.1205	.32750
Polyuria	.4699	.50213	.2410	.43027

HYPERGLYCEMIA

The data regarding the hyperglycemia of both the groups are following:

Table No 4: Summary of one way ANCOVA of final scores of hyperglycemia symptoms of both the groups, considering the pre scores of hyperglycemia as co variate.

Tests of Between-Subjects Effects

Dependent Variable: hyperglycemia post

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Group	.474	1	.474	7.662	.006
Error	10.094	163	.062		
Total	15.000	166			
Corrected Total	13.645	165			

POLYURIA

The data regarding the polyuria symptoms of both the groups are following:

Table No 5: Summary of one way ANCOVA of final scores of Polyuria symptoms of both the groups, considering the pre scores of Polyuria as co variate.

Tests of Between-Subjects Effects

Dependent Variable: polyuria Post

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Group	.729	1	.729	4.322	.039
Error	27.474	163	.169		
Total	59.000	166			
Corrected Total	38.030	165			

TIREDNESS

The data regarding the tiredness of both the groups are following:

Table No 6: Summary of one way ANCOVA of final scores of tiredness symptoms of both the groups, considering the pre scores of tiredness as covariate.

Tests of Between-Subjects Effects

Dependent Variable: tiredness post

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Group	1.548	1	1.548	7.655	.006
Error	32.963	163	.202		
Total	68.000	166			
Corrected Total	40.145	165			

MENTAL STRESS

The data regarding the mental stress of both the groups are following:

TABLE 7: Summary of one way ANCOVA of final scores of mental stress symptoms of both the groups, considering the pre scores of mental stress as co variate

Tests of Between-Subjects Effects

Dependent Variable: mental stress post

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Group	.866	1	.866	9.321	.003
Error	15.153	163	.093		
Total	48.000	166			
Corrected Total	34.120	165			

DISCUSSION

A total of 160 patients were enrolled in to this study. Participation of male patients was larger than females and the maximum number of patients was in the age group of 30-80 years. Effect of counseling was assessed on BMI and selected symptoms of diabetes. Most T2DM patients have some degree of overweight or obesity. [6] It is connected to insulin resistance and prohibit in insulin secretion. These alterations may leads to the appearance and worsening of diabetes. [7] In the present study the mean pre and post scores of BMI of the patients exhibited marginal reduction in experimental group (1.56%) whereas control group exhibited a mean reduction of (1.09%). ANCOVA analysis indicated that the adjusted mean scores of *BMI* between the diabetic subjects who were given holistic counseling and who were not, considering their baselines scores as covariate do not differ significantly (Table No.1.). Therefore it was concluded that counseling had not significantly influenced the *BMI* of diabetics this the probable cause appears to be BMI is hard to diminish with just counseling and if at all counseling has to make any significant change, it has to be longitudinal in nature. Larger waist waist-to-hip ratios (WHR), are reported to indicate a greater degree of central body obesity. This is associated with a characteristic metabolic profile with higher insulin levels, a greater degree of insulin resistance, and a higher prevalence of diabetes. [8] Studies also have shown that the waist circumference is the best predictor of type 2 diabetes mellitus compared to

body mass index, waist/hip ratio and other anthropometric measurements. [9] There is conflicting evidence on the index of obesity that best reflects diabetic risk. From the (table no:2) it is evident that the f value for *waist-hip ratio* between the diabetic subjects who were given holistic counseling and who were not is significant. It indicates that the adjusted mean scores of *waist-hip ratio* between the diabetic subjects who were given holistic counseling and who were not, considering their baseline scores as covariate differ significantly. In this study the improvement in W/H ratio is note as the diabetic patients may have complied with the yogic exercises/Physical exercises introduced through counseling module.

Clinical manifestations polyurea and hyperglycemia are diagnostic as well as therapeutic markers and assessment of these markers is essential to understand status of the disease. Hyperglycemia is a elevation of blood glucose, reduction in blood glucose level improves the clinical progression of the disease at the same time decreasing the risk of complications, in diabetic patients. Analysis for these parameters (Table 4 & 5) indicated a significant change in symptoms of polyuria and hyperglycemia showing an alleviating effect of holistic counseling. Supporting our results a review reports that the indigenous diet may not be useful in lowering the blood sugar to the same extent as insulin and other hypoglycemic agent do, but it has some other influences, which may be useful for the management of the disease and its complications. [10] According to NICE, desmopressin can be considered for nocturnal polyuria, which can be caused by diabetes mellitus, if other medical treatments have failed. [11] One study from 2008 lays out a hypothesis that hyperglycemic and osmotic polyuria play roles ultimately in diabetic nephropathy. [12] From the(table 5) it is evident that the f value for polyuria between the diabetic subjects who were given holistic counseling and who were not being is 4.322 is significant with $df= 1/163$. In this study this

aspects of diabetic symptoms have been recovered better on counseling which offers health benefits for managing polyuria.

Data analysis revealed that the holistic counseling had significantly influenced other symptoms of diabetes which were, mental stress and tiredness .In addition to the physiological impact that mental stress has on glycemia, research has shown that stress interferes with the ability to self manage diabetes. [13] Some approaches to stress that may be useful for individuals with diabetes include using distraction and involvement in pleasurable activities that help to minimize the influence of stress producing activities. [14] From the study it is evident that the f value for mental stress level between the diabetic subjects who were given holistic counseling and who were not being is 9.321 significant with $df= 1/163$ (table 7). A 2013 study of 1657 adults with type 2 diabetes found significant correlations between social support and diabetes tiredness. Researchers found that support from family and other resources decreased fatigue related to diabetes. [15] In the present study it is evident that the f value for tiredness level between the diabetic subjects who were given holistic counseling and who were not being is 7.655 significant with $df= 1/163$ (table 6). Holistic counseling had influenced both the mental stress and tiredness level of diabetics. The patients were counseled not only about nutrition and disease management but also were counseled to have a stress free life by way of systematic living, the way perceiving and tackling things which had created the aforesaid impact.

CONCLUSION

Results indicated that subjects who received periodic, intensive holistic counseling were found to manage their disease more efficiently. Diabetic patients by enhancement in exercise, diet habits and such strategies will also prevent development of diabetic complications to great extend. Patient empowerment is imperative in diabetes management and this can be done through patient education and sharing information on management and

preventive aspects of diabetes. A three months counseling program clearly indicated that this intervention had a positive effect on the management of non-insulin dependent Type 2 diabetic mellitus. On the basis of the findings of this study it may be recommended that patient counseling certainly upgrades the patient's ability to cope with their disease and ultimately making the individual aware for disease management thereby enhancing therapeutic outcomes.

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