MANAGEMENT OF BLOOD GLUCOSE LEVEL AMONG ELDERLY DIABETIC PATIENTS THROUGH YOGA TRAINING

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ABSTRACT

In the contemporary society with the technological and mechanical advancement human life has become luxurious characterized by inactivity and unhealthy lifestyle, human existence is facing highest ever threat as never before. Among these a chronic lifestyle related disease diabetes mellitus (DM) also k/as slow killer, killing 900 persons/day due to Type-2 DM by 2030 India is going to become a diabetic capital (Uppal A. K). Body cells use simpler form of food such as glucose as energy for survival which depends on insulin a hormone produced by Pancreas, but due to DM body does not produce enough insulin or the body cells can't use insulin or the combination of both thereby limiting bodies' ability to use energy found in food or to use glucose in blood streams. This increase blood glucose level above normal. Previous literature revealed numerous benefits of performing yoga in maintaining wellbeing but seek collective efforts on the part of researchers (exploring Yoga in managing blood glucose), society, Government and funding agencies for its management (Viveka P Jyotsna. 2014). Present Research conducted to see the effect of 5 week yoga training program with 5 sessions of 30 minutes a week on 2-hour blood glucose level measured in clinics with professional assistance among diabetic patients. For the study 20 diabetic patients aged 46±3 years divided randomly into two equal groups i.e. treatment and control using pre-test post-test randomized group design. Descriptive stats revealed average pretest post-test blood glucose level of diabetic patient for treatment group was 239.80±19.54mg/dl and 230.20±17.60mg/dl and 243.20±22.39mg/dl 243.10±21.67mg/dl for placebo group respectively. To see weather yoga program has significantly reduced blood glucose level univariate ANCOVA with pretesting as covariate to compare adjusted means of two different groups, since the p-value for F-Statistics was 0.004 less than 0.05 revealed significant difference in post adjusted means. On the basis of findings it has been concluded that practicing Yoga can bring down blood glucose level.

Keywords:

Introduction:

Chronic diseases decrease the quality of life and can also affect compliance with treatment, yogic program can significantly improve psychological, physical, social domains which increase total quality of life and total wellbeing. In the wake to prevent diabetes in the developing countries it has been noted that it lacking specific needs, yoga is tried throughout the world in the view of its numerous benefits proved by some short and long term studies, but seek collective efforts on the part of researchers, society. Government and funding agencies(2) . 900 persons per day are dying because of type-2 diabetes daily and by 2030 India is going to be a world capital of diabetes(6) . Exercise improves insulin sensitivity and reducing adiposity can improve glucose uptake in both type-1 and type-2 DM patients. Traditionally aerobics exercise, weight training are performed for fitness as they require lot space and sophisticated equipment's and are more intense at the same time yoga is an excellent way of bringing balance to the mental, physical, emotional and spiritual well-being in a little space and no equipment's required. Studies have shown that yoga has an impact on lipid profile, glycemic control and cardiovascular status thus can help in management of diabetes mellitus(5) . Medical research in western world revealed that diabetes is a physical disorder and it require only physical modalities of intervention for its management as regular physical exercise can have beneficial effects in both types of DM. Regular participation in yoga can have many physical and mental benefits Decrease fasting blood glucose, Lower blood pressure, Improve cholesterol and triglycerides. Lower stress hormone level including plethora of strength, balance, immune, weight loss and stress related benefits(4) . Diabetes is a chronic lifestyle related disease it limits body's ability to use energy found in food. The human body cells cannot use food which we ate directly as a form of energy; this complex form of food must be broken down into simpler form to make it available for the cells as an energy source. The complex form of carbohydrate which we eat is converted into glucose which fuels the cells in the body, but at the same time body cells need insulin a hormone found in blood streams in order to receive glucose and use it for energy, due to diabetes mellitus three conditions occurs first where body does not make enough insulin, second the body cells can't use the insulin i.e. insulin resistance and third is the combination of both. If the body cells does not use glucose the amount of glucose increases in blood which can further damage blood vessels, heart, kidneys, eyes or nervous system, therefore diabetes is severe and should never be left untreated, untreated diabetes can eventually leads to stroke, heart disease, kidney disease, blindness and nerve damage.

Type-1 Diabetes Mellitus	Type-2 Diabetes Mellitus	Type-3 Diabetes Mellitus
Also Known as Insulin dependent diabetes. Occurs mostly in Children's, thereby also called as Juvenile diabetes is the result of autoimmune destructions Characteristics: lac of insulin is immunosuppressive and is kidney toxic. Break down islets in pancreas. 5-10% cases.	Also Known as non-Insulin dependent diabetes. It occurs as the individual ages, thereby called adult-onset diabetes mellitus. It is a metabolic Disorder. Characteristics: Hyperglycemia, High blood sugar. Symptoms: Polydipsia (Excess Thirst). Polyuria (Frequent urination). Polyphagia (constant hunger). 90% cases. It is a chronic disease long term complications may leads to obesity, heart disease, stroke, kidney failure. Amputation, diabetic retinopathy where eyesight is affected.	Also known as gestational diabetes. This type of diabetes occurs in pregnant women where a woman exhibits high blood sugar during the third trimester. In this type of diabetes insulin receptors does not function properly.

Significance:

In the present scenario where human lifestyle has become luxurious characterized by inactivity, unhealthy diet and due to various other lifestyle constraints the living species are prone to plethora of lifestyle related diseases such as diabetes, heart diseases, over-weight and obesity etc. W.H.O report on diabetes reported that by 2030 India will be diabetic capital. The present study focused on two burning issues of the present date i.e. yoga as a measure to counter diabetes. The findings of the study will provide the insight into the curative aspect of yoga.

Practical implications:

The present study has practical implications for diabetic patients in curing the severity of disease and those who are on the verge of becoming diabetic (obese) and the study possess informative knowledge for all living beings to fallow active & healthy lifestyle to escape from slow killer.

Objectives:

To ascertain the amount of change in blood glucose level produced by the 5 weeks yoga program.

Hypothesis:

The 5-weeks yoga program will significantly reduce blood glucose level in the diabetic patients.

Methodology:

The present experiment was conducted to see the effect of 5-weeks yoga training on blood glucose level of diabetic patients, for the study 20 diabetic patients both male and female (age 46±3) divided randomly into equal 10 controlled and 10 in experimental group were selected from Udhampur district of Jammu and Kashmir. The experimental group was given training in city ground.

Experimental design:

The experimental design was selected so that various threats to internal and external validity can be controlled for the present study pretest-posttest Randomized –groups design was used. Both the groups were asked to test the glucose level before and after the treatment.

Experimental Group O_1 T O_2

Control Group O_1 - O_2

Experimental group was given yoga training with 5 sessions a week, whereas to ascertain maximum involvement and seriousness of the control group blind setup was used which makes them to participate 30 minutes of activity 2 times a week including walking, low intensity jogging.

Planning of an Experiment:

Yoga training was given to the experimental group for 5 weeks with 5 sessions a week. The 40 minute sessions were planned in the evening time due to the availability of the subjects. The training includes following variables starting with sun salutation:

Asanas

Pranayama

  (i) Kapalbathi
  (ii) Anulom Bilom.

Data Collection: The subjects were asked to test their glucose level from the clinic themselves and then their result was collected for analysis.

Table-1

W.H.O Norms Diagnosing Diabetes [7]

Condition	2 hour Glucose	Fasting Glucose
Normal	<140mg/dl or <7.8mmol/l	<110mg/dl or <6.1mmol/l
Diabetes Mellitus	≥200mg/dl or ≥11.1mmol/l	≥126mg/dl or ≥7.0mmol/l

Statistics: Descriptive and repeated measure ANOVA.

Results and Discussion

The data on 2-hour blood glucose level taken after two hour of meal on the elderly diabetic patients was tested for mean and standard deviation (pre-post), range and normality using descriptive statistics. The data revealed that average pretest post-test blood glucose level of diabetic patient for treatment group was 239.80±19.54mg/dl and 230.20±17.60mg/dl and 243.20±22.39mg/dl 243.10±21.67mg/dl for the group which did not receive actual treatment respectively. Range of the data showed all the samples were suffering from diabetes when compared to WHO norms. Normality testing revealed most of the data was normally distributed except the post data of treatment group which showed departure from symmetricity as statistical value of skewness was twice of its standard error .687.

Table-2

Mean and Standard deviation of different groups measured in post testing

Self-explanatory

Training	Mean	Std. Deviation	N
Yoga Training	230.2000	17.60555	10
Placebo	243.1000	20.55048	10
Total	236.6500	19.76513	20

Table-3

Adjusted mean and standard error of different groups in post testing

Training	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Yoga Training	231.654[a]	2.134	227.153	236.155
Placebo	241.646[a]	2.134	237.145	246.147

Covariates appearing in the model are evaluated at the following values: Pretest Score = 241.5000.

The adjusted mean and standard error for the criterion variable in treatment and control group after adjusting for covariate (pretest score on 2-hour blood glucose level) to compensate for initial difference in the scores or to eliminate the effect of covariate to ensure the effectiveness of yoga training in curing diabetes.

Table-4

ANCOVA table for the post test data on blood glucose level

Source	Type I Sum of Squares	Df	Mean Square	F	Sig. (p-value)
Pretest	6155.974	1	6155.974	135.732	.000
TRAINING	495.561	1	495.561	10.927	.004
Error	771.015	17	45.354		

Total	1127487.000	20			
Corrected Total	7422.550	19			
a. R Squared = .896 (Adjusted R Squared = .884)					

The final result of ANCOVA at .05 significance value shows the F-value for comparing the adjusted means on 2-hour blood glucose level between two groups (treatment group gone through yoga training and control group) F-value calculated to compare treatment and control groups is significant because the p-value associated with it is less than 0.05 thus the null hypothesis of no significant difference may be rejected at .05 level of significance. As F-value for pretest (covariate) was also significant which shows the initials conditions of the treatment group was not same which justified the use of ANCOVA after adjusting the mean value of criterion variable for the covariate.

Lessons learnt for future research

There are numerous issues in arranging classes/sessions, these barriers are physical, exercises; motivation issues, inadequate intensity, and/or duration of yoga program; and insufficient personalization of program to individual needs. Though community-based studies are looking feasible, these factors should be considered when designing future programs.

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