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## Role of 15 days Intervention of Yoga in Type-2 Diabetic Patients in Relation to FBS, Sleep & Stress

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### ABSTRACT

Modern Era is an era of lifestyle disorders. Type 2 diabetes is growing out to be a global pandemic, having a significant impact on the economy, especially in developing countries like India. In recent decades, extensive research on *Yoga* therapy has shown the value of *Yoga* as an effective alternative to medical management and also for long term recovery for the treatment of these conditions like Diabetes mellitus. Keeping this in mind a study was done to measure the efficacy of 15 days *Yoga* Intervention on FBS, sleep and stress in patients with Type 2 Diabetes. A total number of 40 patients were selected randomly. The patients received the supervised *Yoga* module and the data analysis was done statistically. The present study showed that 15 days *Yoga* Intervention in relation to FBS, sleep & stress in patients with Type 2 Diabetes significantly improves the fasting blood sugar level & brings great changes in the quality of their sleep & reduction of Stress in patients with Type 2 Diabetes.

### KEYWORDS

*Yoga, Type 2 Diabetes, Stress, sleep, FBS*



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## INTRODUCTION

In the Modern Era psychosomatic disorders are on rise due to the abnormal lifestyle. It is observed, most people follow unhealthy lifestyle, with minimal physical activities, miss on their food and sleep schedule. This has given rise to number of NCD's. These new Non-Communicable Diseases (NCD) are: obesity, diabetes, cardiovascular diseases, hypertension, musculoskeletal diseases, osteoporosis, mental health problems, depression and even cancer. 60% of the diabetic population in the world is from Asia. India follows China at number 2 across the globe in number of Type 2 Diabetes patients. India will become the global capital of diabetes if this lifestyle disease will not be managed in time<sup>1</sup>.

## YOGA AND DIABETES, IAYT (INTEGRATED APPROACH TO YOGA THERAPY)

The general sense of well-being, alertness and care, combined with traditional medical treatment, without any secondary effects, results in a strong metabolic feature. *Yoga* is likely a more than one way change of Type 2 DM status<sup>2</sup>. Different *Yoga asanas* can be directly rejuvenating / regenerating pancreatic cells as a result of which the use and metabolism of glucose can be increased by enzymatic process of peripheral tissues, liver and adiposis<sup>3</sup>.

So, *Yoga* has given diabetic patients a chance of having relatively less complicated life with medicine. The limited evidence indicates the positive effect of *Yogic* on the levels of blood sugar and quality of life of the sample<sup>4</sup>.

*Yoga* has been examined to manage symptoms and diabetes mellitus type II complications<sup>4</sup>.

## AIMS & OBJECTIVES

### Aim

The objective of this study is to measure the efficacy of 15 days intervention of *Yoga* on FBS, Sleep and Stress in Type 2 Diabetes patients.

### Objectives

- To Compare the FBS levels, Sleep and Stress levels pre and post *Yoga* Intervention.
- To spread awareness of *Yoga* among people to adapt a healthy lifestyle.

### Hypothesis

- 15 days *Yoga* module is effective among T2DM.

### Null hypothesis

- 15 days *Yoga* intervention is not effective on T2DM.

## METHODOLOGY

### SUBJECTS Source of subjects

The subjects of the study are residents of Urban area of Kathua & Hiranagar, Jammu



& Kashmir, and were randomly chosen, willing to join the 15 days *Yoga* Intervention Camp.

#### Age Range and Gender

The age ranged between 20 years and 70 years both male and female.

#### Sample Size

The number of participants for the study is n=40.

#### Inclusion Criteria

- Type 2 diabetics Patients
- Age between 20-70 years
- Both Male and Female
- No prior exposure to *Yoga*
- Subjects with no major diseases than diabetes
- Desirable to participate in the prospective study

#### Exclusion Criteria

- Non Diabetic
- Subjects with any other serious medical illness
- Subject with any psychological disorder and with its regular medication
- Patients of any chronic illnesses, with vital organ damage Disease or Stroke or Chronic Renal Failure
- Diabetics with complication like psychiatric illnesses, recent cardiac surgery in the past 3 months and pregnant women were not included.

#### Ethical Consideration

- All the participants expressed their willingness to participate in the study and signed the informed consent form.
- It was informed to the participants that the information they provide will be kept highly confidential.

#### DESIGN OF THE STUDY

Single group Pre-Post design. The subjects were chosen randomly and received supervised *Yoga* Module as mentioned in Table No. 1

**Table 1** *Yoga Module*

<i>Yoga</i> Group	Pre-assessment	15 days IAYT	Post-assessment
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#### Variable studied

A variable is a measurable characteristic that varies. It can change over time from group to group, individual to person or even in a single person.. The variable taken into consideration in this study is the participant's FBS level before and after the intervention.

#### Intervention

Participants underwent yoga based lifestyle change as described in Table No.2 with regular *Yoga* practice, *Surya namaskar*, Cyclic meditation, *Pranayam*, Relaxation techniques and lecture on various related topics like diet, *kosha*, *Yoga*, diabetes etc. to create awareness.

**Table 2** Yoga Postures

Name	Posture	Practices
<b>Breathing Exercise</b>	Standing	Hand in out breathing
<b>Loosening practices (5min)</b>	Standing	<i>Hastauttanasana, Padhastasana, Ashvasanchalanasana</i>
	Prone (lie down on abdomen)	<i>Bhujangasana – Parvatasana</i>
(In sitting <i>Vajrasana/Sukhasana</i> ) <i>A, U, M, AUM</i> chanting		
<b>Surya Namaskara (SN)</b>	<i>Hastauttanasana</i>	<i>Bhujangasana</i>
	<i>Padhastasana</i>	<i>Parvatasana</i>
	<i>Ashvasanchalanasana</i>	<i>Shashankasana</i>
	<i>Tulasana</i>	<i>Ashvasanchalanasana</i>
	<i>Shashankasana</i>	<i>Padhastasana</i>
	<i>Sashtangpranipadasana</i>	<i>Hastauttanasana</i>
<b>Relaxation Technique</b>	Quick Relaxation technique (QRT)	
<b>Asana</b>	<i>Vakrasana</i>	
<b>Pranayama</b>	<i>Nadishudhi, Bhramari</i>	
<b>Advance Technique</b>	Cyclic Meditation (CM) (35 mins)	

## DATA EXTRACTION & ANALYSIS

### Data Extraction

- Pre and Post Fasting Blood Sugar (FBS) readings of each participant were taken by Lab technician during the *Yoga* Camps Organized by me.
- Sleep Quality data was extracted using the Pittsburgh Sleep Quality Index (PSQI).
- Stress level data was collected using Depression, Anxiety and Stress Scale (DASS 21).

### Data Analysis

- Data Analysis of FBS readings was done on Excel Sheet.
- Data Analysis regarding quality of sleep was done using the Pittsburgh Sleep Quality Index.
- Data Analysis regarding level of Stress was done using DASS 21.

### Procedure

- The participants contacted me telephonically and personally after they got to know about the camp through word of mouth and banners.
- On the starting day of the camp the participants were asked to fill in the informed consent form.
- The FBS level of the participants was measured on the days of commencement and conclusion of the camp.
- The intervention was given for the period of 15 days.
- At the end of the camp the participants were given the same module to be practiced at home.

## RESULTS

The Gender profile of the patients has been described in Table No. 3.

**Table 3** Male/Female Ratio

Particulars	Participants	Number
Male/Female Ratio	Male	27
	Female	13
<b>Total</b>		<b>40</b>

The mean Pre and Post FBS of the patients was calculated to rule out the percent change in Fasting Blood Sugar before and after Yoga Intervention. (Table No. 4)

**Table 4** Mean FBS (Pre & Post)

Participants	N	Mean Pre FBS	Mean Post FBS	% Change
Total	40	184.95	176.725	-4.45%

The mean value of sleep before and after Yoga Intervention was calculated to rule out the percent change. (Table No. 5)

**Table 5** Mean Sleep (Pre & Post)

Participants	N	Sleep (Pre)	Sleep (Post)	% Change
<b>Total</b>	<b>40</b>	<b>1.525</b>	<b>1.025</b>	<b>-32.79%</b>

The mean value of stress before and after Yoga Intervention was calculated and the percent change was ruled out. (Table No. 6).

**Table 6** Mean Stress (Pre & Post)

Participants	N	Stress (Pre)	Stress (Post)	% Change
<b>Total</b>	<b>40</b>	<b>3.1</b>	<b>2.25</b>	<b>-27.42%</b>

## DISCUSSION

Based on the previous studies on *Yoga* and Diabetes Mellitus it is observed that *Yogasanas* in combination with conventional medical treatment provides a better metabolic control giving a feeling of general well-being, alertness and attentiveness without any side effects. Various *Yogasanas* may be directly

rejuvenating/regenerating cells of pancreas as a result of which there may be increase in utilisation and metabolism of glucose in the peripheral tissues, liver and adipose tissues through enzymatic process. The limited recorded evidence show the positive impact of *Yogic* exercise on the studying blood sugar levels and quality of life. The present study of 15 days Intervention of Yoga in relation to FBS, Sleep & Stress indicates :-

**Table 7** Mean change in Pre & Post FBS

Mean Pre FBS	Mean Post FBS	% Change
184.95	176.725	-4.45%

The mean value of FBS before *Yoga* Intervention is 184.95 with S.D was 29.56 & the mean value of FBS after Yoga Intervention is 176.725 with S.D was 29.64 with % change of -4.45% shows significant change in FBS levels. (Table No. 7)

**Table 8** Mean change in Pre & Post Sleep pattern

Sleep (Pre)	Sleep (Post)	% Change
1.525	1.025	-32.79%

The mean value of Sleep before *Yoga* Intervention is 1.525 with S.D was 0.75 & the mean value of Sleep after Yoga Intervention is 1.025 with S.D was 0.65 with % change of -32.79% shows significant improvement in Sleep Pattern in the participants. (Table No. 8).

**Table 9** Mean change in Pre & Post Stress

Stress (Pre)	Stress (Post)	% Change
3.1	2.25	-27.42%



The mean value of Stress before *Yoga* Intervention is 3.1 with S.D was 0.66 & the mean value of Stress after *Yoga* Intervention is 2.25 with S.D was 0.51 with % change of -27.42% shows significant change in Stress levels. (Table No. 9)

## CONCLUSION

The above result clearly shows that 15 days Intervention of *Yoga* in relation to FBS, Sleep & Stress in Type 2 Diabetic Patients significantly improves the fasting blood sugar level & brings great changes in the quality of their sleep & reduction of Stress in Type 2 Diabetes patients..

However further randomized control studies need to be performed to confirm the present findings which will be carried in future.

*Yoga* is very much beneficial to prevent and manage lifestyle disorder Type 2 Diabetes.

The above discussion leads us to the conclusion that *Yoga* proved to be effective in reducing FBS & also improves the quality of Sleep and reduces the Stress in patients suffering from Type 2 Diabetes.

## APPRAISAL

Strength of the study

1) Professional lab technician was hired to collect and verify blood samples to avoid discrepancies.

2) Study proves the efficacy of *Yoga* for patients with Type 2 Diabetes.

3) Direct *Yoga* Intervention provides more accurate results.

4) *Yoga* Practices according to the SVYASA *Yoga* Module eg. Cyclic Meditation has created a lot of Interest in Participants' mind.

## Limitations of the study

1) There was no control group. This study was a 'Single group Pre-Post design' study.

2) Sample size was small.

3) Intervention was a short term design of 15 days.

## Scope for future studies

1) Presence of a control group could make the research more feasible.

2) The intervention period could be extended and made longer up to one month to get more significant results.



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