

## THE IMPACT OF TRADITIONAL YOGA PRACTICE ON PSYCHOLOGICAL WELL-BEING IN DIABETIC WOMEN: A STUDY IN INDIA

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### Abstract

*Regular exercise, especially 'yoga', has been reported to be a useful adjunct to the management of type 2 diabetes, especially as people adopt sedentary lifestyles and medications become less effective. . This intervention study investigated the impact of her two low-cost interventions, yoga and social support, on the quality of life (QOL) of her type 2 diabetic woman. Block randomization was performed on her six blocks. The focus of the discussion was how to apply the panel's disease prevention strategies to everyday life. At the beginning and end of the study, her quality of life was assessed in her four domains of physical, psychological, social and natural space using her QOL BREF from the World Welfare Association. The QOL BREF has been translated and approved. The social and ecological space significantly increased in the companion bunch and the natural space significantly increased in the yoga bunch, according to a paired t test. However, this disappeared in the association between the two bunches, probably as a result of poor glucose control and the short 90-day study period. Because this study was only conducted in women with poor glycemic control over a short period of time, the benefits of yoga and peer support on outcomes were not significant.*

**Keywords:** Traditional, Yoga Practice, Psychological, Well-Being, Diabetic, Women

### 1. Introduction

Yoga is a sophisticated concept and methodology that has been practiced for millennia in ancient India. According to the conventional definition of yoga, which is presented in the well-known Yoga Sutras of Patanjali, "Yogaschittavrttinirodhah" suggests that yoga is stopping the variations and examples of the brain. Yoga can be described as a method of self-acknowledgment that provides all-encompassing instruction, a comprehensive viewpoint on life, and a practical means

for this objective in order to give it a deductively clearer meaning. Yoga entails a variety of profound, moral, mental, and physical exercises that promote overall welfare, well-being, and a higher degree of mindfulness. Although there are many other types of yoga, the majority of sessions taught in the West focus on the body and are classified as hatha yoga. Asanas, breathing exercises, relaxation methods, and occasionally even meditative practices are all included in hatha yoga. The explicit physical positions it maintains throughout practice, such as relaxing presentations, breath rules, and extended support for the stances, set it apart from other types of actual practice in a number of ways. They include brain-body techniques, Eastern developmental paradigms (like aikido or karate), and ongoing mindfulness throughout practice.

Over the past thirty years, yoga research has increased, largely as a result of the advantages it offers in terms of welfare. In addition to having restorative effects for a number of significant physical and psychological problems, yoga appears to be a valid strategy for enhancing physical and mental functioning in healthy people. When it comes to genuine wellness and cardiovascular qualities, audit concentrates frequently show beneficial results in terms of adaptability, balance, strength, weight reduction, pulse, breath, and general cardiovascular endurance.

Insulin resistance and diabetes mellitus are becoming more prevalent, especially in resource-constrained countries like India. As well as contributing to the cause and progression of diabetes, psychological distress is increasingly recognized as a significant secondary effect. Studies conducted in the US and India have demonstrated the viability and usefulness of diabetes prevention programs. An ancient Indian practice known as yoga combines methods for reducing stress such as meditation, various positions, guided breathing, and visual symbolism.

In order to prepare for and conduct study in yoga using the most recent logical techniques, the Foundation of Yoga and Awareness was established in 1985 in Visakhapatnam, southern India, under the protection of Andhra College. We oversaw a 40-day yoga retreat for persons with type 2 diabetes mellitus (T2DM) and evaluated the outcomes on a clinical, biochemical, and psychological level. Here, we report the concentrate's discoveries.

## **2. Literature Study**

Chaya et al. (2013) conducted a randomized controlled experiment to examine the effects of yoga on the cognitive abilities of T2DM patients with chronic ischemic stroke. According to the research, regular yoga practice significantly enhanced mental abilities like leadership, memory, and thoughtfulness. This implies that yoga may significantly benefit diabetics who have suffered a persistent ischemic stroke.

In order to research the use of yoga as an additional choice and correlative methodology for the treatment of diabetes mellitus, Sharma et al. (2016) conducted a purposeful survey. The survey looked at many studies and discovered evidence suggesting that yoga meditations can enhance glycemic control, insulin awareness, and overall quality of life in diabetics. Yoga has also been linked to favorable effects on lipid profiles, body composition, and circulatory strain.

In their 2018 study, Raveendran et al. looked at yoga's healing effects in T2DM. They highlighted the potential benefits of yoga for enhancing lipid profiles, insulin responsiveness, and glycemic management in T2DM sufferers. Body weight, circulatory strain, and oxidative pressure are just a few of the physiological factors connected to diabetes that yoga has been proven to significantly affect. Additionally, it was suggested that regular yoga practice can be a crucial supplementary therapy for T2DM management.

Singh et al. (2012) commissioned a study to investigate the effects of yoga training on lipid profiles in T2DM patients. The study shown that a yoga meditation led to improvements in lipid profiles, including lower levels of total cholesterol, fatty compounds, and low-density lipoprotein cholesterol. These results imply that yoga practice may significantly improve lipid digestion and cardiovascular health in T2DM patients.

Yoga's effects on diabetes patients' lipid profiles and glycemic management were examined by Vyas and Dikshit (2011). According to the study, regular yoga practice significantly improved glycemic management as seen by drops in fasting blood glucose and glycosylated hemoglobin (HbA1c) levels. Additionally, yoga meditation was linked to significant lipid profile improvements, including drops in total cholesterol, fatty acid, and low-density lipoprotein cholesterol levels. These findings suggest that yoga may profoundly impact the way that persons with diabetes process glucose and regulate their lipid levels.

Rani and Begum (2011) examined the benefits of yoga training on quality of life and psychological health in patients with type 2 diabetes mellitus (T2DM). The study showed that regular yoga practice was associated with improvements in emotional well-being and quality of life, including lower levels of stress, tension, and sadness. Members described improved health, greater care, and largely psychological working. These findings suggest that yoga may enhance efforts to improve emotional health and overall quality of life in T2DM patients.

Satish et al. (2018) created a randomized controlled trial to investigate the impact of yoga training on metabolic risk factors, such as insulin resistance/hyperinsulinemia and adiponectin levels, in obese and non-stout people with T2DM. According to the experiment, yoga meditation significantly reduced insulin blockage and hyperinsulinemia, indicating a more advanced level of insulin awareness. Additionally, yoga practice was linked to higher levels of adiponectin, a crucial indicator of metabolic health. These findings imply that yoga may help improve metabolic functioning by reducing T2DM-related metabolic risk factors.

### **3. Methodology**

Previous studies of fasting blood glucose, glycated HbA1c, and quality of life variables indicated that the predicted test size ranged from 5 to 40, with a predicted decrease in fasting plasma glucose (FPG) of 32 mg/dL, HbA1c reduction was 10 mg/dL. At least 0.5%. The minimum and maximum sample size for the study was 40 in each group, bringing the total of the 3 randomized preliminary open-name samples provided to a maximum of 120.

#### **3.1. Inclusion criteria**

Subjects included people with type 2 diabetes aged 30 to 65 who had been screened in the past eight years and those with HbA1c levels of 7 to 10%.

#### **3.2. Exclusion criteria**

The study did not allow participants with significant clinical or mental conditions, weight records (BMI >35 kg/m<sup>2</sup>), introspection, ongoing alcohol use, known diabetes complications, pregnancy, or lactation, therapy with alternative pharmaceutical arrangements.

The women gave thoughtfully informed consent before having their pattern assessed by a doctor. The same techniques were used by those undergoing pharmaceutical or nonpharmacological treatment. Each participant in the study received a diet instruction and was instructed to practice for about 10 minutes per day.

### **3.3. Randomization**

Members were randomly selected using block randomization with a predetermined block length of 6. All three arm A, B and C potential stages were identified. It was determined using a publicly distributed odd list. Each number in this breakdown has been replaced by a block. This unpredictable order of distribution was devised by a person unaffiliated with primary clinic testing and mailed in numbered, opaque rigid envelopes to health center testing staff. Assignments were distributed roughly 1:1:1.

The Morals Panel Endorsement was given on August 8, 2011 by the Institutional Morals Advisory Committee of the Foundation. Registered under CTRI/2011/12/002227 was the initial.

The primary outcomes considered were FPG, HbA1c, quality of life, and medication adherence (Morisky Prescription Adherence Scale 8). This paper describes his quality of life results from a publishable glycemetic outcomes study. Quality of life was assessed in four separate domains.

Analyze social, physical, environmental and psychological using the widely used WHOQOL BREF, validated in local languages. Healthcare community workers not directly involved in the study assessed quality of life at the beginning and end of the study. Other studies investigated FPG, HbA1c, medication adherence, and additional outcomes such as BMI, waist-hip ratio, and blood cholesterol.

### **3.4. Statistical methods**

Means and standard deviations of quantifiable evaluation factors for each referral lot were examined. Using one-way ANOVA, he compared the three groups and examined the difference in mean increase in score components from the baseline period to the follow-up period to determine the significance of disagreement.

### **3.5. Yoga intervention**

Trainers lead 60-minute yoga sessions twice a week. Each day, the women received various instructions, such as how to practice at home and how to keep daily notes. The 60-minute session includes 25 minutes of 12 phases of Surya Namaskara, 5-7 minutes of deep relaxation techniques and 15 minutes of asanas or yoga poses. According to diabetic yoga experts, the poses were Pavanamuktasana in Prostate Posture, Bhujangasana and Sharavasana in Inclined Posture, and Ardhamatsyandrasana in Seated Position. Then there was 15 minutes of pranayama. In addition, records of food eaten, medications used, and activity information were kept for 2 and 7 days and were considered representative of the entire week. This is checked frequently.

If a study participant was found to have hypoglycemia (random plasma glucose [RPG] 70 g/dL) during the monthly study, the oral medication dose was reduced by 20% to 50%, regardless of side effects. I was.

### **3.6. Peer support intervention**

Three partner tutors from the neighbourhood were selected and trained. Eligibility requirements included having had type 2 diabetes for at least 1 year, having an RPG less than 250 mg/dL at her last measurement, being generally compliant with the study group's treatment and behavior modification plan, and having the required It includes obeying competence and duty. When participating in training, understand the classification of patients and agree to consult relevant specialists in the event of unforeseen problems during participation. Peer tutors underwent a two-day training program that covered the etiology of diabetes, physical changes brought on by diabetes, complications from poor glycemic control, a blueprint for the medications used, their system of action, and cooperative energies with practical work. The nutritionist organized the somewhat complex range of dietary and healthy aspects of diabetes; the doctor wrote the complementary instructions on interpersonal skills, compassion, and privacy. In light of the companions for advancement handbook, a guidebook for the buddy guides was created and delivered to the instructors for future use.

### **3.7. Peer support sessions**

13–14 diabetic women would be seen by each buddy coach. 45-60 minute weekly face-to-face meetings with diabetics to discuss companion support elements such as assisting with disease management and implementation of preventive measures in daily life, providing in-depth social support, and working with clinicians. and provide proactive, adaptive and ongoing support. Shortly after, at the same moment, the phone rang. Leading experts also decided to study the measures monthly. During the first meeting, my tutor friend learned about the specifics of the treatment, including medication, diet, and actual work. During subsequent visits, attendants supported and monitored women regarding calorie counting, exercise, appropriate medication use, extreme pressure, side effects, and foot care. At the final appointment of the third month, Buddy Coach led the final evaluation of the entire cycle, including benefits, challenges, and value for participants. Diaries were also given to participants to record visits, partner trainer suggestions and improvements.

Each patient was examined monthly and considered comprehensively. The benchmark group received normal level of care. A pre-tested, imprecise survey was used to collect sociodemographic and other data.

#### 4. Results

The mean study group ages in the three groups ranged from 42.83 to 42.86 years, and the mean time since diagnosis of diabetes ranged from 4.2 to 4.7 years. The groups' levels of glycosylated haemoglobin increased from 8.3% to 8.5%, a sign of inadequate control in at-risk women. The three groups were quantitatively comparable in terms of age, the length of diabetes, occupation, salary, and family structure [Table 1].

**Table 1:** Comparison of baseline data for yoga, peer support and control groups.

	Yoga			Peer support			Control			p
	n	Mean	SD	n	Mean	SD	n	Mean	SD	
<b>Age (years)</b>	36	42.86	6.30	34	42.83	9.23	39	42.83	5.68	0.88
<b>Per capita income (INR)</b>	36	895.46	1883.23	34	824.04	2465.24	39	1503.24	5836.6	0.58



<b>FPG (mg/dl)</b>	36	254.36	57.67	32	266.88	60.28	39	275.58	82.03	0.38
<b>HbA1c% (mmol/mol)</b>	36	8.4 (90)	2.56	32	8.3 (68)	2.53	39	8.5 (73)	2.74	0.98
<b>BMI (kg/m<sup>2</sup>)</b>	35	35.92	4.98	32	34.45	5.43	37	35.57	5.2	0.76
<b>Waist hip ratio</b>	35	0.86	0.04	33	0.86	0.05	38	0.8	0.06	0.53
<b>BP systolic (mmHg)</b>	35	143.67	30.52	33	137.58	27.06	39	135.72	24.6	0.05
<b>BP diastolic (mmHg)</b>	35	93	22.52	33	92.4	8.4	39	87.52	8.53	0.22
<b>Adherence</b>	32	4.57	2.83	28	4.25	2.63	38	4.07	2.76	0.55
<b>Total cholesterol (mg/dl)</b>	36	330.56	42.38	32	325.89	27.32	39	325.52	52.28	0.43
<b>Diabetes duration (years)</b>	33	4.7	3.87	35	4.25	3.64	38	4.2	4.03	0.53

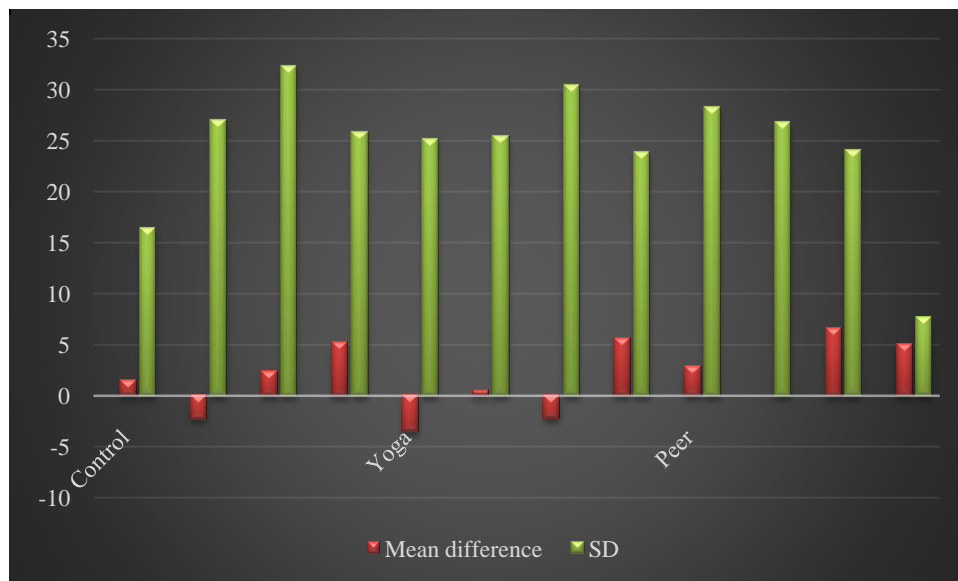
Quality of life scores in the social and environmental categories estimated by WHOQOL BREF before mediation were consistently higher than in the physical and psychological domains in each of the three parliaments. According to the paired t-test, the social and natural domains of quality of life were significantly expanded in the companion support group, with scores of 6.58 (24) and 5.06 (7.67) at  $P = 0.014$  and  $P = 0.019$ , respectively. ) increased. The most important factor was not psychological. At  $P = 0.05$ , the increase in ecological area value by yoga group reached significant significance (Table 2).

**Table 2:**Quality of life score before and after surgery

	<b>QOL</b>	<b>Mean difference</b>	<b>SD</b>	<b>P</b>
<b>Control</b>	<b>Pre-physical/post physical</b>	1.522	16.43	0.57
	<b>Pre-psychological/ post psychological</b>	-2.32	27	0.62



	<b>Pre-social /post social</b>	2.37	32.27	0.87
	<b>Pre-environmental/ post environmental</b>	5.23	25.83	0.26
<b>Yoga</b>	<b>Pre-physical/post physical</b>	-3.56	25.2	0.43
	<b>Pre-psychological/ post psychological</b>	0.48	25.43	0.98
	<b>Pre-social /post social</b>	-2.25	30.43	0.64
	<b>Pre-environmental/ post environmental</b>	5.54	23.87	0.05
<b>Peer</b>	<b>Pre-physical/post physical</b>	2.89	28.3	0.4
	<b>Pre-psychological/ post psychological</b>	0.0006	26.8	2.00
	<b>Pre-social /post social</b>	6.58	24.04	0.024
	<b>Pre-environmental/ post environmental</b>	5.06	7.67	0.035



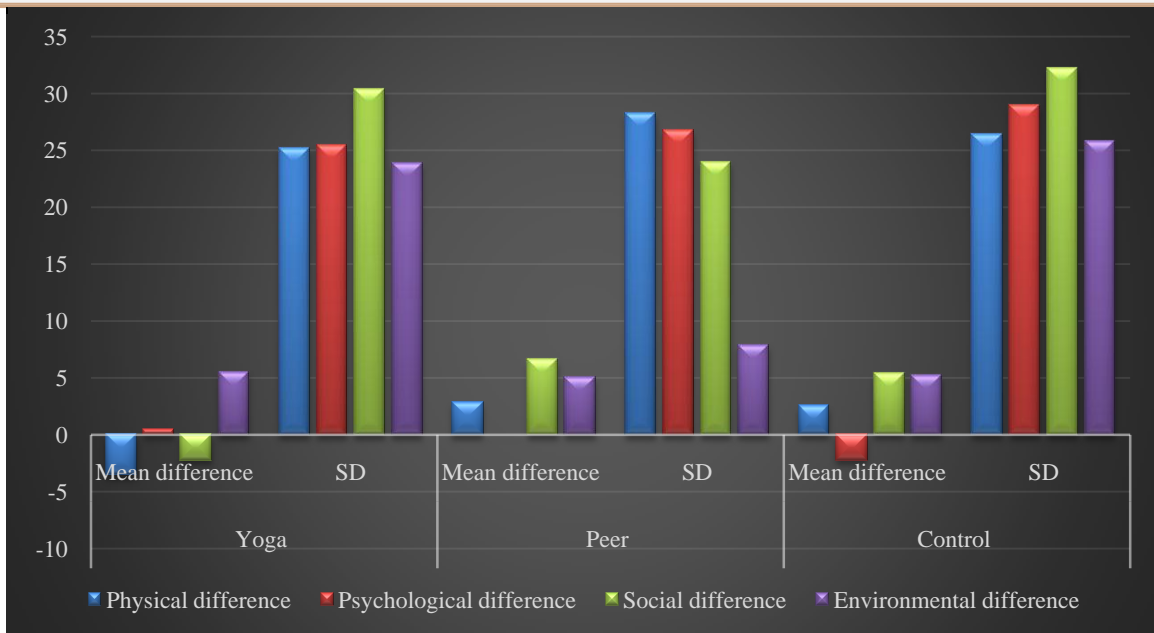
**Figure 1:**Quality of life score before and after surgery

Surprisingly, the yoga group displayed lower QOL ratings in the physical and social spheres. Instead of the sense of wellbeing expressed by yoga practitioners, this was the case. It can take

more time than expected for this to be reflected in QOL scores. The improvements in the natural environment scores were, respectively, 5.54 (23.87), 5.06 (7.85), and 5.23 (25.85) in the yoga, buddy, and control groups. In contrast to the control group, which showed a fall in scores, the yoga and buddy group showed a slight improvement in the psychological area. Compared to the control group's social score of 5.38 (32.27), the buddy group increased significantly to 6.58 (24.02), while the yoga group decreased slightly. Peer group ratings in the actual environment grew as compared to the benchmark group by 2.89 (28.3) points, while the yoga group unexpectedly witnessed a decline of 3.56 (25.2). Although there were patterns, none of them were significant [Table 3].

**Table 3: Quality of life scores vary by category.**

	Yoga		Peer		Control		P
	Mean difference	SD	Mean difference	SD	Mean difference	SD	
<b>Physical difference</b>	-3.56	25.2	2.89	28.3	2.52	26.4	0.255
<b>Psychological difference</b>	0.48	25.43	0.0006	26.8	-2.23	29	0.85
<b>Social difference</b>	-2.25	30.43	6.58	24.02	5.38	32.27	0.206
<b>Environmental difference</b>	5.54	23.87	5.06	7.85	5.23	25.85	0.88



**Figure 2:**Quality of life scores vary by category

The members of the study panel who watched the mediations voiced the following criticisms. 96.8% of the yoga group said that the conversation was both interesting and useful. Many study participants claimed to feel more intelligent and sincerer. The focus group consisted of (25/32) participants, and side effects like dry mouth, polyuria at night, and joint discomfort significantly decreased. Additionally, the patients reported having less intense pain and more energized and joyful. A small percentage of patients (10/32) also reported a reduction in blood sugar. A few team members also felt let down by the project's conclusion. One of them went on to say that she discovered doing yoga classes helped her retain information from school.

#### 4.1. Peer support

According to the latest ratings from companion coaches (25/26), 96.1% of students were enthusiastic about this excellent peer support program, exhibited excellent attitudes and readily accepted instruction from their peer tutors. Both the guides and the mentee considered this to be a rewarding program. Regarding assistance with daily administration, the companion tutor had the power to persuade the mentees to adhere to calorie restriction, exercise, and medication use, as well as the power to observe first-hand how these actions affected various aspects of

infectious prevention, such as lowering blood sugar levels at the next visit. Dietary changes were also successful in reducing the amount of rice consumed and in making wheat-based foods the second choice. A small number of patients (6/26) also saw that increasing exercise and eating wheat-based foods helped manage blood sugar. With decreasing rice consumption and the addition of wheat in a population where rice is a socially preferred food, veggies helped lower sugar levels. Although a few women (15/26) required to change their eating habits, it was challenging because of family culinary traditions. Assuming that the ability of social and fundamental reassurance was taken into consideration, almost any (8/26) focus group participants acknowledged that they felt much better after discussing family concerns with the companion guide. Due to competing family needs, patients did not fully grasp the capability of linking to clinical consideration. Giving the mentee's friend guide's phone number so they can call them at any time during the focus and establishing connections between the friend tutors and the examiners so they can contact them at any time ensured progressing accessibility of aid.

The buddy coaches found this to be a very rewarding and genuinely enjoyable exercise akin to a diabetic; they may finally see the changes produced by sticking to their own diet, exercise, and medication regimens. Coaches were happy to learn solutions to problems affecting other diabetic women because it energized them, gave them exercise when they walked to see them, taught them that stress makes infections worse, helped them understand other people's problems, and gave them the opportunity to work with others and understand their perspectives. Another positive trait was the ability to assist others. Two diabetic women (2/10) who could have avoided the visits and preferred Ayurveda were among the challenges, as were the patients' continued inaccessibility at home due to work and other commitments, and the numerous changes in phone numbers that made telephone follow-up challenging.

## **5. Discussion**

In both the buddy group's social and ecological setting and the yoga group's natural space, there was a significant improvement in QOL scores; however, these distinctions vanished when the effects of the two groups were examined separately. 96% of those who took part in the mediation bunches agreed that it was helpful.

Increasing wellbeing and achieving a good QOL are the major objectives of treating any chronic illnesses, including diabetes mellitus. A pooled analysis of population-based study's in countries such as Germany shows that type 2 diabetes has a negative impact on health-related quality of life, and good quality of life is fully associated with good consistency. Average quality of life scores was higher in healthy people than in the diabetic group across all dimensions, including physical, mental, emotional and behavioural. Because it influences how a person regulates their own behaviour as well as other essential psychosocial components like grief, considering psychosocial difficulties is essential for offering efficient diabetes treatment. They are important areas of strength simply because difficulties exist.

According to Jyotsna et al., a comparable interventional focus on yoga breathing techniques (Sudarshan kriya) has improved participants' physical, psychological, and social well-being after 90 days as well as their absolute scores and access to outdoor space at six months. This study is different from what we are focusing on since it was carried out over a longer time period, people of both genders were involved, and it would benefit from HbA1c values between 7 and 7.29. Although between-group examination has not been stated (only active data are available), a significant improvement in QOL after three and a half years after starting yoga has also been considered. Precise surveys indicate that yoga may assist to enhance QOL, but an effective randomized control experiment is required to establish this. Despite the paucity of available data, yoga may potentially enhance QOL.

Friends can provide support and control, serve as useful role models for supported behavioural change, and provide guidance. In Thailand and her three other countries in sub-Saharan Africa, patients' quality of life was observed to improve after receiving peer support. Patients who communicate with colleagues receive reliable and useful assistance in establishing and maintaining daily patterns of behaviour that are important in managing their chronic disease. This may be the reason why we did not see a significant increase in buddy support for group exams in the areas of natural and social issues. An evaluation conducted in Austria of like-minded people who offered advice or initiative found no significant improvement in quality of life in mediation groups. This is because the pattern level was carefully controlled. In this case, progression was allowed because HbA1c was stable. These results are not applicable to all

diabetics, especially since more motivated and self-sufficient individuals participated in this study when HbA1c levels were already high.

Although between-group analyses were not shown, educational interventions for older adults with diabetes and hypertension showed improved quality of life assessments using the WHOQOL 100. The sickness was reported to be more overwhelming in bigger women than in heavier men, a sexual preference that has been documented. In the seminal UKPDS study, it was observed that confusions caused by illness had an effect on quality of life, but that helpful arrangements could lower the probability of entanglement-related QOL consequences.

The studypanellists recognized the advantages of both types of meditation, yoga, and peer support. Patients and buddy coaches were able to delve further into the issues that each patient was encountering thanks to peer support. Additionally, it assisted patients in coming up with long-lasting solutions, which, despite some objections, seems to be immensely fulfilling for both mentees and friend coaches. Participants in the yoga group experienced less side effects from their diabetes, better sleep, reduced worry, and lessening of throbbing ligament pain. Longer-term assessments should be taken to evaluate this disparity in discernment and QOL scores.

## **6. Conclusion**

Recent research has shown that strong young women who practice hatha yoga on a regular basis see gains in their core strength, flexibility, and balance but no changes in their BMI, muscle-to-fat ratio, resting heart rate, or pulse variability. It is generally accepted that while weekly repetitions of yoga meditation are sufficient for making positive changes in some aspects of actual wellness, longer preparation periods and higher weekly repetitions are needed to improve physiological, particularly cardiovascular, factors. However, when worthwhile outcomes develop over time, commitment to the quality actual labor may increase, and the cycle may eventually come full circle in an ethical manner. The process of measuring quality of life in medical settings is intricate and multifaceted, and in this study, the discernments and scores paint a different picture. It is anticipated that this difficult group of women with poor glycemic control will require a longer amount of study time.

## References

1. Brown DHK. *Seeking spirituality through physicality in schools: learning from 'Eastern movement forms'*. *Int J Child Spirit*. (2013) 18:30–45. doi: 10.1080/1364436X.2013.776521
2. Chaya MS, Ramakrishnan G, Shastry S, et al. *Effect of yoga on cognitive functions in Type 2 diabetes mellitus patients with chronic ischemic stroke: A randomized controlled study*. *Indian J Psychiatry*. 2013;55(Suppl 3):S357-S363. doi:10.4103/0019-5545.116315
3. Govindaraj R, Karmani S, Varambally S, Gangadhar BN. *Yoga and physical exercise—a study and comparison*. *Int Rev Psychiatry*. (2016) 28:242–53. doi: 10.3109/09540261.2016.1160878
4. Innes KE, Selfe TK. *Yoga for adults with type 2 diabetes: A systematic study of controlled trials*. *J Diabetes Res* 2016; 2016:6979370.
5. Kumar K. *A study on the effect of yogic intervention on serum glucose level on diabetics*. *International Journal of Yoga & Allied Sciences*. 2012; 1:68-72
6. Mahajan AS. *Role of yoga in hormonal homeostasis*. *Int J Clin Exp Physiol*. 2014; 1:173-78
7. Park CL, Elwy AR, Maiya M, Sarkin AJ, Riley KE, Eisen SV, et al. *The Essential Properties of Yoga Questionnaire (EPYQ): psychometric properties*. *Int J Yoga Therap*. (2018) 28:23–38. doi: 10.17761/2018-00016R2
8. Rani PR, Begum S. *Study of the effect of yoga training on quality of life and mental health of type 2 diabetes mellitus patients*. *Int J Yoga*. 2011;4(1):33-37. doi:10.4103/0973-6131.78178
9. Raveendran AV, Deshpandae A, Joshi SR. *Therapeutic role of yoga in type 2 diabetes*. *EndocrinolMetab (Seoul)*. 2018;33(3):307-317. doi:10.3803/EnM.2018.33.3.307
10. Satish L, Lakshmi K, Subramanian R, et al. *Effect of yoga training on metabolic risk factors like insulin resistance/hyperinsulinemia and adiponectin levels in obese and non-obese subjects with type 2 diabetes mellitus: A randomized controlled trial*. *Int J Yoga*. 2018;11(3):247-254. doi: 10.4103/ijoy.IJOY\_59\_17
11. SatyanandaSaraswati S. *Four Chapters on Freedom. Commentary on the Yoga Sutras of Sage Patanjali*. Munger: Yoga Publications Trust (2013).





12. Sharma A, Mishra A, Mishra S, et al. Yoga as an alternative and complementary approach for the treatment of diabetes mellitus: A systematic study. *J Clin Diagn Res.* 2016;10(8):YE01-YE06. doi:10.7860/JCDR/2016/20049.8326
13. Singh S, Malhotra V, Singh KP, et al. Study of the effect of yoga training on lipid profile in type 2 diabetics. *Indian J PhysiolPharmacol.* 2012;56(1):43-48.
14. Tim J, Keller S, Winkler H, Wetgasser R, SonnichsenA. Can a peer support intervention improve type 2 diabetes outcomes? *Diabetes Voice* 2014; 59:60
15. Vyas R, Dikshit N. Effect of yoga on glycemc control and lipid profile in diabetic patients. *Indian J ClinBiochem.* 2011;26(1):71-74. doi:10.1007/s12291-010-0074-y