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Yoga as a Therapeutic Modality in Diabetes Management: A Comprehensive Review

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ABSTRACT

Diabetes mellitus has become a widespread chronic condition with serious health consequences if left untreated.[1] Recent estimates by the International Diabetes Federation indicate that over 11% of adults worldwide are affected, with majority of the people who are not aware of their diagnosis[2]. Type 2 diabetes, in particular, is linked to sedentary lifestyles, poor diet, and insulin resistance[3]. As managing diabetes requires a multifaceted approach, yoga has gained recognition as a supportive therapy. Incorporating physical postures, breathing techniques, cleansing practices, and meditation, yoga targets both physical and psychological aspects of the disease. Several yogic postures, such as Surya Namaskar, Vakrasana, Ardha Matsyendrasana, etc., stimulate internal organs, including the pancreas, and help regulate insulin production. Breathing practices like Nadi Shuddhi and Bhastrika enhance oxygenation, promote parasympathetic activity, and improve metabolic function. Additionally, stress-reducing practices like meditation and Yoga Nidra play a critical role in lowering cortisol levels and improving blood glucose control. This review emphasizes yoga's role as a holistic intervention that not only supports glycemic control but also improves overall quality of life. Its integration into standard diabetes care may offer a non-pharmacological, cost-effective strategy for long-term management and prevention of complications.

Key Words *Diabetes, Yoga, Asanas, Pranayama, Meditation, Insulin Resistance*

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INTRODUCTION

The World Health Organization estimates that non-communicable diseases (NCDs) are linked to 74% of global mortality, with diabetes recognized as one of the four major NCDs. The 2025 International Diabetes Federation Diabetes Atlas highlights that approximately 11.1% of adults between 20 and 79 years—roughly one out of every nine people—are affected by diabetes. Approximately 40% of individuals with diabetes remain undiagnosed, leaving them unaware of their health status.[2]

Yogic Management:

Dr. Bernard Lown—a visionary cardiologist, humanitarian, and Nobel Peace laureate quoted "You don't have to control your diabetes. You just have to control what you do every day."

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Hence, Yoga therapy proves to be a great way for daily discipline and mindfulness, and it helps to manage Diabetes through consistent lifestyle choices. However, Yoga therapy should be advised to the patient, taking into note the patient's overall health, individual requirements, associated risk factors, and contraindications.

The following is a set of yoga techniques along with duration, which prove to be useful in diabetes:

Table1 Duration of Yoga techniques

Sl.No.	YOGA TECHNIQUES	APPROXIMATE DURATION AND REMARKS
01.	**CLEANSING PRACTICES: SHUDHI KRIYA**	
	a. Kapalbhati(Frontal brain purification)	5 rounds,120 strokes
	b. AgnisaraKriya(stimulating the digestive fire)	5 rounds
	c. Vamana Dhauti(stomach cleansing)	Once a week
	d. Full Shankhaprakshalana(intestine cleansing)	Once a year
	e. Laghu Shankhaprakshalana(short intestine cleansing)	Every 40 days
02.	**PREPARATORY PRACTICES (SookshmaVyayama)**	5-10 minutes
03.	**SURYA NAMASKARA**	Slow speed,3-7 rounds as per one's capacity
04.	**YOGA POSTURES/ASANAS**	
	1. Standing Postures:	
	a. Trikona Asana (Triangle pose)	Hold the final pose for 15 seconds. Gradually increase duration up to 1 minute.
	b. Tadasana (Palm tree pose)	Same as above
	c. TiryakTadasana (Bent Palm Tree Pose)	Same as above
	d. Virabhadrasana (Warrior pose)	Same as above
	2. Sitting Postures:	
	a. Vakrasana (Spinal Twist)	Hold the final pose for 15 seconds. Gradually increase duration up to 1 minute.
	b. Ardhamatsyendrasana (Seated Spinal Twist)	Same as above
	c. Mandookasana (Frog pose)	Same as above
	d. Ushtrasana (Camel pose)	Same as above
	e. Paschimottanasana (Seated forward bend)	Same as above
	3. Prone Poses:	
	a. Bhujangasana (Cobra pose)	Hold the final pose for 15 seconds. Gradually increase duration up to 1 minute.
	b. Dhanurasana (Bow pose)	Same as above
	c. Naukasana (Boat Pose)	Same as above
	d. Makarasana (Crocodile Pose)	Relaxation pose,2-5 minutes/As needed
	4. Supine Poses:	
	a. Pawanamuktasana (wind releasing pose)	Hold the final pose for 15 seconds. Gradually increase duration up to 1 minute.
	b. Supta Vajrasaana (Supine thunderbolt pose)	Same as above
	c. Sethubandasana (Bridge pose)	Same as above
	d. Matsyasana (Fish pose)	Same as above
	e. Shavasana (Corpse pose)	Relaxation pose,2-5 minutes/As needed
	5. Inversions	
	a. Sarvangasana (Shoulder stand)	Hold the final pose for 15 seconds. Gradually increase duration up to 1 minute.
	b. Halasana (Plough pose)	Same as above
05.	**PRANAYAMA**	
	a. Nadi shudhi Pranayama	15 minutes
	b. Chandra bhedana(Left nostril breathing)	5 minutes
	c. Surya bhedana(Right nostril breathing)	5 minutes
	d. Bhastrika(bellows breath)	3-5 minutes
	e. Bhramari(humming bee breath)	5 rounds

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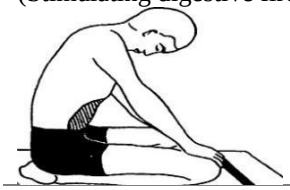
	f. Sheetali/Sheetkari	3-5 minutes
06.	**BANDHA**	
	Uddiyan bandha(Abdominal Lock)	5 rounds
07.	**MUDRAS**	
	Linga Mudra,SuryaMudra,PranaMudra,ApanaMudra,Gyan Mudra	15-45 minutes
08.	**MEDITATION**	10minutes or more
09.	**Aum CHANTING**	5 minutes
10.	**YOGA NIDRA**	30 minutes

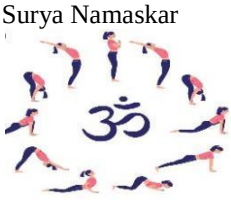
The therapeutic effect of Yogic practices on Diabetes has been mentioned in Table No.2

Table 2 Therapeutic Effect of Yogic Practices on Diabetes

1. Cleansing Practices (Shuddhi Kriyas)

Practice	**Therapeutic Effect on Diabetes**
Kapalbhati (Frontal brain & abdominal stimulation) 	• Stimulates pancreas and abdominal organs [7,8] • Improves insulin sensitivity[9] • Reduces abdominal obesity and stress[7,9]
Agnisara Kriya (Stimulating digestive fire (Agni) 	• Improves digestive efficiency[8] • Enhances liver and pancreas function[8,9] • Helps regulate blood glucose [10]
Vamana Dhauti-Stomach cleansing (induced vomiting) 	• Detoxifies stomach and upper GI tract[11] • Improves metabolism[12] • Aids insulin regulation[12]
Full Shankhaprakshalana (Deep intestinal cleansing)	• Balances metabolism[12] • Improves gut microbiota[13] • Resets glucose metabolism[13]
Laghu Shankhaprakshalana (Mild colon cleansing)	• Aids digestion[12] • Supports detoxification[12,13] • Improves absorption for glucose management[13]

2. Yoga Asanas (Postures)

Asanas	**Therapeutic Effect on Diabetes**
Surya Namaskar 	Combines movement and breath to improve insulin sensitivity and manage weight efficiently[7].
Trikonasana (Triangle Pose)	Stimulates abdominal organs, aiding digestion and blood sugar regulation[7,14].

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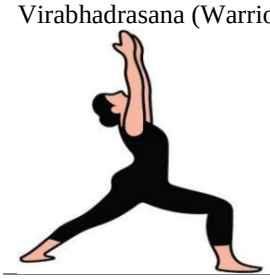
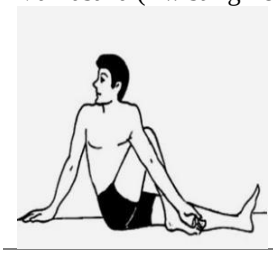
Tadasana (Palm Tree Pose) 	Enhances posture and focus while supporting hormonal balance and metabolic functions.
TiryakTadasana(Swaying Palm Tree Pose) 	Promotes lateral abdominal muscle activation and detoxification through improved digestion[7,15]
Virabhadrasana (Warrior Pose) 	Aids circulation, calms the nervous system, and supports digestive and endocrine health[7,15].
Vakrasana (Twisting Pose) 	Applies pressure on the pancreas and liver; helps in glucose metabolism and digestion[16].
Ardha Matsyendrasana 	Stimulates pancreas, liver, and kidneys; enhances insulin release and digestion[14,15]
Mandookasana (Frog Pose) 	Compresses the abdominal region, improving pancreatic function and reducing visceral fat [7]
Ushtrasana (Camel Pose)	Activates the endocrine system, especially the pancreas; improves insulin function[14,15]

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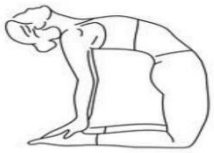
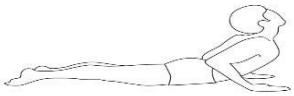
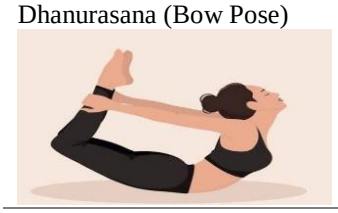
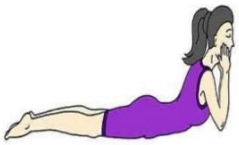
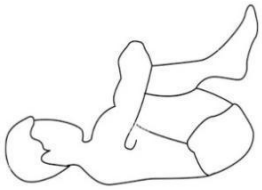
	
Paschimottanasana (Seated Forward Bend Pose)	Stimulates abdominal organs and pancreas; supports blood sugar reduction and weight loss[14,15]
	
Bhujangasana (Cobra Pose)	Stimulates the abdominal region, reduces stress, and enhances pancreatic health[14,15,16]
	
Dhanurasana (Bow Pose)	Strengthens internal organs; improves insulin sensitivity and digestion[14,15].
	
Naukasana (Boat Pose)	Stimulates the pancreas and liver; aids in balancing blood glucose [15,16].
	
Makarasana (Crocodile Pose)	Calms nervous system; restores hormonal balance and aids relaxation[14].
	
Pawanamuktasana (Wind Relieving Pose)	Enhances digestion, reduces gas and bloating, supports glucose absorption[15,16].
	
Supta Vajrasana (Sleeping Thunderbolt Pose)	Stimulates digestive organs; tones the pancreas and improves endocrine balance [16]
	

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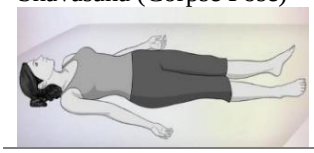
Sethu Bandhasana(Bridge Pose) 	Stimulates thyroid and pancreas; reduces stress and stabilizes blood sugar[17]
Matsyasana (Fish Pose) 	Massages the abdominal organs, supporting glucose metabolism. [15,17]
Shavasana (Corpse Pose) 	Deep relaxation reduces cortisol, thus lowering blood glucose[18]
Sarvangasana (Shoulder Stand) 	Balances hormone-producing glands; supports thyroid and pancreatic function[17]
Halasana (Plough Pose) 	Aids digestion and stress reduction; enhances nervous system stability [15,17]

3. Pranayama (Breathing Techniques)

Pranayama	**Therapeutic Effect on Diabetes**
Nadi Shuddhi 	Balances the autonomic nervous system and reduces stress-related glucose fluctuations[20]
Chandra Bhedana 	Cooling effect on the nervous system; helps in lowering blood pressure and sugar[15]
Surya Bhedana 	Enhances metabolic activity and supports glucose oxidation[14].
Bhastrika	Activates the pancreas, increases oxygen supply, and promotes detoxification[18]

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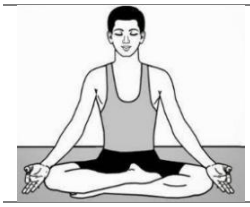
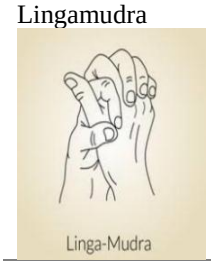
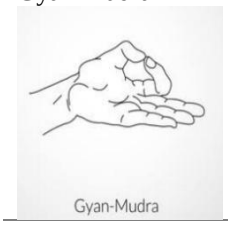
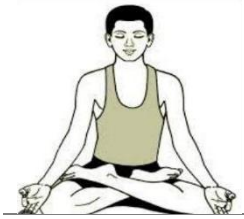
	
Bhramari 	Reduces anxiety and stabilizes blood sugar levels[14,16]
Sheetali/Sheetkari 	Cools the body, calms the mind, and regulates appetite [15].

4. Bandhas, Mudras, and Meditation

Practice	**Therapeutic Effect on Diabetes**
Uddiyan Bandha 	Stimulates the pancreas and improves metabolic function and digestion
Lingamudra 	Enhances body heat and metabolism, supporting better glucose regulation[14,16]
Gyan Mudra 	Promotes mental clarity and nervous system balance
Aum Chanting 	Reduces cortisol and activates the parasympathetic nervous system[21]
Yoga Nidra	Induces deep relaxation, reduces cortisol, and improves glucose metabolism[14]

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Meditation 	Decreases stress and promotes endocrine harmony, enhancing glycemic control[19,14]

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DISCUSSION

Yoga presents itself as a comprehensive, low-risk, and cost-effective approach to managing type 2 diabetes. The integration of specific asanas, pranayama techniques, kriyas, mudras, bandhas, and meditative practices has shown promise in supporting glycemic control, improving pancreatic function, and enhancing the body's overall metabolic efficiency[22]. Postures like Ardha Matsyendrasana and Dhanurasana directly stimulate abdominal organs such as the pancreas and liver, thereby encouraging insulin secretion and glucose regulation[16.] . Similarly, breathing techniques including Nadi Shuddhi and Bhastrika have demonstrated beneficial effects in enhancing oxygenation, reducing sympathetic nervous system dominance, and improving stress tolerance[23].

Stress is a significant contributor to increased cortisol levels, which can exacerbate insulin resistance and glucose imbalance. Mindfulness-based practices, including meditation, yoga nidra, and chanting, help activate the parasympathetic nervous system and reduce cortisol levels, ultimately contributing to improved glycemic[24] control. Cleansing practices like Shankhaprakshalana and Kapalbhati also play a role in detoxification, improving gut health, and enhancing the absorption of essential nutrients, all of which contribute to better metabolic outcomes [25].

Several studies support the incorporation of yoga as an adjunct therapy for diabetes, reporting improvements in fasting blood glucose, HbA1c levels, and insulin sensitivity[26]. The holistic nature of yoga makes it uniquely suited for addressing not only the physical aspects of diabetes but also the psychological stressors that often accompany the condition.

CONCLUSION

The reviewed evidence underscores the value of integrating yoga into standard diabetes management protocols. As a holistic practice, yoga offers multifaceted benefits—enhancing metabolic function, promoting insulin secretion, reducing stress, and improving overall quality of life. While it should not replace conventional treatment, yoga can serve as a complementary modality that empowers patients to take an active role in their health. Further clinical research is recommended to establish standardized protocols and understand long-term effects. Nonetheless, current findings validate yoga's potential as a supportive therapy in managing type 2 diabetes effectively [27]

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