



Integrated Yoga Module for Muscular Dystrophy: An Evidence-Based Review of The IAYT Model

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Abstract

Background: Muscular dystrophies (MDs) refer to a group of inherited disorders that cause progressive weakness and degeneration of skeletal muscles. Conventional management focuses on physical therapy, medication and supportive care, but yoga has emerged as a complementary therapy offering holistic healing. **Objectives:** This paper aims to explore how the Integrated Approach of Yoga Therapy (IAYT) can support patients with Muscular Dystrophy by improving physical function, emotional stability and overall quality of life. **Methods:** The review of the literature is compiled from authentic sources, including PubMed, Google Scholar, Web of Science, Yoga Research Journals and traditional yogic texts. The paper interprets the application of the IAYT model—Annamaya, Pranamaya, Manomaya, Vignanamaya, and Anandamaya Kosha for the holistic management of Muscular Dystrophy. **Results:** The available studies are small, heterogeneous, and mostly pilot or add-on designs; however, they consistently demonstrate feasibility and signal benefits, particularly in pulmonary function and specific measures of mobility and quality of life. Evidence quality is low to moderate; randomised, adequately powered trials are lacking. IAYT's person-centred framework fits the multi-domain needs of MD patients. **Conclusion:** Yoga, delivered within an IAYT framework and integrated with physiotherapy and respiratory care, is a promising adjunct for MD rehabilitation. We present a replicable Integrated Yoga Module (IAYT-MD) and recommend priority research designs to evaluate safety, efficacy and mechanisms.

Keywords: Muscular Dystrophies (MDs), Duchenne Muscular Dystrophy (DMD), Yoga Therapy, IAYT Model, Panchakosha, and Rehabilitation.

Introduction

Muscular dystrophies (MDs) are inherited neuromuscular disorders characterized by progressive muscle weakness, fibre degeneration, and functional decline resulting from defects in muscle-supporting proteins [1,2]. Duchenne Muscular Dystrophy (DMD) is the most common and severe form, typically beginning in early childhood and advancing to loss of ambulation, joint contractures, cardiomyopathy, and respiratory failure [3,4]. Current management, including corticosteroids, physiotherapy, respiratory care, and emerging gene therapies, slows progression but cannot halt or reverse muscle degeneration. Given the multidimensional burden of MD, interest has grown in complementary, holistic approaches that address physical, respiratory, emotional, and psychosocial needs. Yoga therapy, integrating asana, pranayama, relaxation, and meditation, aims to improve musculoskeletal alignment, respiratory efficiency, autonomic regulation, and mental well-being. Preliminary studies suggest that yoga may improve pulmonary function, functional performance, emotional resilience, and quality of life in children with DMD, and is a feasible adjunct to physiotherapy [5,6,7]. The Integrated Approach to Yoga Therapy (IAYT), developed at SVYASA, provides a structured therapeutic model based on the Panchakosha framework, which views health through five layers of human existence—Annamaya (physical), Pranamaya (energy/breath), Manomaya (mental-emotional), Vignanamaya (intellectual), and Anandamaya (bliss) [8,9]. Applying IAYT to MD supports posture, muscle function, respiratory regulation, emotional coping, and overall quality of life through a multidimensional lens. While emerging evidence is promising, the current literature on yoga for MD remains limited, heterogeneous, and largely at the pilot level, lacking standardized protocols and rigorous clinical evaluation. This underscores the need to systematically examine available findings and develop a structured, safe, evidence-informed yoga module tailored for individuals with MD. Therefore, this review synthesises existing research on yoga and IAYT-based interventions for muscular dystrophy, evaluates their therapeutic potential, and proposes a standardized Integrated Yoga Module to guide rehabilitation practice and future clinical trials.

Methods

Scope: Peer-reviewed clinical trials, pilot studies, systematic/narrative reviews, and Yoga & physiotherapy comparative studies focusing on MD (primarily DMD) and related neuromuscular disorders.

Search strategy: Targeted searches of PubMed/PMC, Scopus and Google Scholar for terms: “Yoga AND Muscular Dystrophy”, “Physiotherapy AND Muscular Dystrophy”, “Yoga AND Duchenne”, “Panchakosha”, “Integrated Approach to Yoga Therapy AND Musculoskeletal problems”, “Yoga Breathing AND Pulmonary Function AND DMD” up to 2025. (Representative, high-impact and open-access sources were prioritized.)

Selection and synthesis: Because of heterogeneity (intervention content, dose, outcome measures), a narrative synthesis approach was used; key study characteristics and findings are summarized in Table 1 (reviews and key primary studies).

Table 1 — Selected reviews and primary studies (synthesis)

Title & References	Design	Intervention (core elements)	Outcomes Measured	Key finding
Decoding the integrated approach to yoga therapy: Qualitative evidence-based conceptual framework [10].	Narrative/ Conceptual (IAYT framework)	Describes the IAYT model principles and clinical integration	N/A (framework paper)	IAYT emphasizes individualised multimodal therapy + counselling; a useful conceptual base for chronic conditions.
Effects of yoga breathing exercises on pulmonary function in patients with Duchenne muscular dystrophy: an exploratory analysis [6].	Exploratory study - DMD (children)	Yogic breathing exercises training program	Pulmonary function (FVC, FEV1, PEFr)	Feasible; improvements in several pulmonary parameters vs baseline.
<i>Effect of Yoga and Physiotherapy on Pulmonary Functions in Children with Duchenne Muscular Dystrophy – A Comparative Study</i> [5].	Randomized comparative/ controlled studies — DMD	Yoga and physiotherapy vs physiotherapy alone	Pulmonary function, Peds QoL, functional tests	Yoga as an adjunct is acceptable; some pulmonary and QoL benefits reported, but mixed results.
Harnessing the benefits of yoga for myositis, muscle dystrophies, and other musculoskeletal disorders. [7].	Narrative review	Collates evidence across myopathies	Multiple: pain, motor function, QoL	The evidence base for muscle diseases is in its infancy; yoga shows promise for improving pain, motor, and pulmonary outcomes.
Effect of yoga on individuals with Duchenne muscular dystrophy — A systematic review. <i>Paper presented at the World Physiotherapy Congress</i> , [11].	Systematic review (conference proceedings)	Various yoga interventions in DMD	Respiratory, mobility, HRV, QoL	All included studies reported improvements, but heterogeneity prevents meta-analysis; calls for better trials.

Results –

High-level findings –

1. Feasibility/Acceptability: Multiple pilot trials and controlled comparative studies report that yoga is feasible and acceptable for children with DMD and their caregivers; sessions were tolerated and caregiver participation facilitated adherence [13].

2. Pulmonary outcomes: Several studies report improvements in pulmonary function tests (e.g., forced vital capacity, peak expiratory flow) following yoga breathing interventions or combined yoga/physiotherapy programs. These findings are promising, given the high morbidity associated with respiratory decline in MD [6].

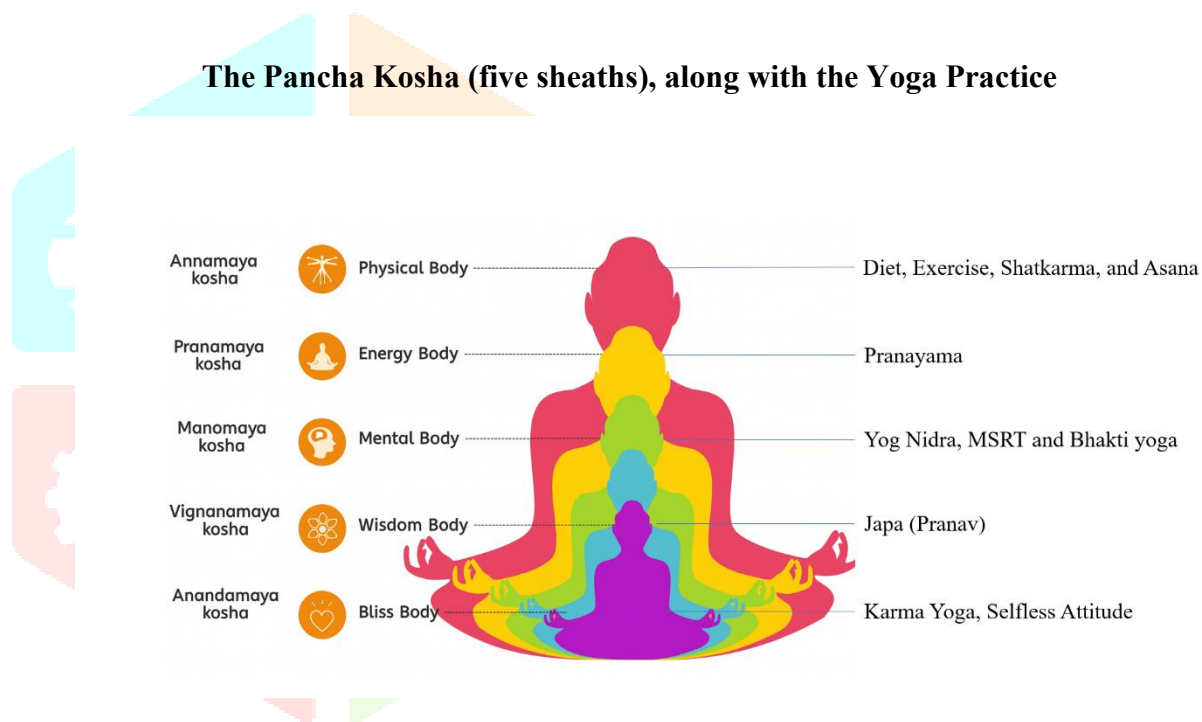
3. Functional and mobility measures: Short residential IAYT programs and yoga-based interventions have shown improvements in timed functional tests (e.g., Timed Up and Go, sit-to-stand) in non-MD and some NMD contexts; small MD studies report some benefit but data are limited [12].

4. Autonomic / HRV effects: Yoga interventions produced favourable autonomic changes in small studies, which may be relevant to cardiac/ANS regulation in DMD but require careful cardiac monitoring due to underlying cardiomyopathy risk [13].

5. Quality of evidence: Predominantly small sample sizes, varying designs (pilot RCTs, non-randomized comparative), inconsistent outcome measures and short follow-up. Systematic evidence is inconclusive, although it is directionally positive [11].

IAYT Model for Muscular Dystrophy (The Panchakosha)

Pancha Kosha is a Sanskrit concept, where “pancha” means “five” and “kosha” means “sheath” or “layer.” It refers to the five layers of human existence or awareness that help in discriminating between the Self and the non-Self. The concept of the Pancha Koshas originates from the *Taittiriya Upanishad*, which describes these five sheaths as fundamental dimensions of human existence [14].



Annamaya kosha (Physical body)

Annamaya Kosha, the physical sheath, represents the body, composed of food and matter, which is maintained through nourishment and movement. In Muscular Dystrophy, this kosha is directly affected as muscle degeneration weakens the physical structure. Yoga supports this sheath by enhancing circulation, flexibility, and muscular endurance through gentle asanas and relaxation techniques. Research indicates that yoga practices enhance musculoskeletal strength and functional mobility in individuals with chronic neuromuscular disorders [9], and regular asana practice improves muscle tone and reduces fatigue [15].

Diet: Ayurveda interprets muscular dystrophy as a Vata imbalance with depletion of *mansa dhatu*, recommending warm, unctuous, protein-rich foods such as ghee, milk, mung dal, nuts, and dates to nourish tissues and improve vitality. Panchakarma therapies, combined with specific diets, have shown clinical improvements, including enhanced muscle strength and reduced CPK levels in patients with Duchenne and limb-girdle dystrophy. Anti-inflammatory herbs, such as turmeric and ginger, along with sattvic foods, including fresh fruits, vegetables, whole grains, legumes, nuts, seeds, and dairy, support digestion, energy,

and overall muscle function, although this has not been directly studied in medical research. Avoiding tamasic foods (processed items, red meat, excess sugar) helps prevent Vata aggravation. Animal studies have yielded mixed results, as evidenced by a mouse model where modified high-protein diets did not improve pathology, underscoring the need for individualised, human-specific dietary approaches [16].

Exercise for Muscular Dystrophy: Sukshma Vyayam includes various standing poses designed to enhance strength and flexibility. The practice incorporates the Manibandh Shakti Vikasaka, which focuses on strengthening the wrists and the Anguli Shakti Vikasak, intended for finger exercises. It also includes Kohni Shakti Vikasak to enhance elbow strength, and Bhujja Bandh Shakti Vikasak to develop the arms. For the neck, the exercises include Griva Shakti Vikasak parts 1, 2, and 3. Additionally, Purna Bhujja Shakti Vikasaka targets full arm strength, while Rekha Gati Shakti Vikasaka involves movement-based exercises. Finally, Pada Sanchalan and heel walking are included to improve leg strength and balance [17,29].

Shatkarma - Shatkarma included Laghu Shankhprakshalan and Kapalbhati, as per Dhargave et al. (2019), with modifications to ensure safety and suitability for participants with Muscular Dystrophy [5].

Asana - The asana practice consisted of Tadasana, Vrikshasana, Vakrasana, Makrasana, Bhujangasana, Pawanmuktasana, Markatasana, and Setubandhasana, as well as Ardh Shalabhasana and Shavasana [5, 18, 21].

Pranamaya kosha (Energy body)

Pranamaya Kosha, the vital energy sheath, governs the flow of prana (life force) through the body and sustains physiological functions. In Muscular Dystrophy, impaired energy flow contributes to fatigue and muscle weakness [31].

Pranayama: Nadi shodhana, Bhramari, Anulom vilom Bhastrika and Yogic breathing [5,19].

Practices like pranayama and gentle asanas help balance this energy, improving oxygenation, vitality, and neuromuscular coordination. Research indicates that controlled breathing enhances autonomic balance and increases oxygen utilisation efficiency [1], while yogic interventions improve energy metabolism and reduce fatigue in neuromuscular conditions [15].

Manomaya kosha (Mental Body)

Manomaya Kosha, the mental sheath, governs emotions, thoughts, and sensory processing. In Muscular Dystrophy, an imbalance in this kosha can lead to anxiety, fear, or frustration due to physical limitations. Through yoga practices such as pranayama and mindfulness meditation, mental fluctuations are stabilised, promoting calmness and emotional balance.

Practices: Yog Nidra, Mind Sound Resonance Technique (MSRT), and Bhakti yoga [20, 21].

Research suggests that yogic breathing and meditation can help reduce anxiety and enhance emotional regulation by modulating autonomic and limbic activity. Additionally, mind-body yoga practices have been shown to enhance mood and reduce psychological distress in individuals with chronic illnesses [22-23].

Vignanamaya kosha (Wisdom body)

Vignanamaya Kosha is the sheath of intellect and inner wisdom, governing discrimination, insight, and decision-making. In Muscular Dystrophy, strengthening this kosha through mindful awareness and meditative practices helps enhance emotional stability, cognitive control and acceptance of physical limitations. This inner awareness reduces stress-related degeneration and supports adaptive coping.

Research indicates that yogic meditation practices activate cortical regulation and enhance psychological well-being in neuromuscular disorders [1, 23, 24].

Practices: Japa(pranav) [5]. Cultivating faith through mantra chanting (e.g., Om Namō Bhagavate Vasudevaya) and self-inquiry strengthens willpower and acceptance [25, 27].

Anandmaya kosha (Bliss body)

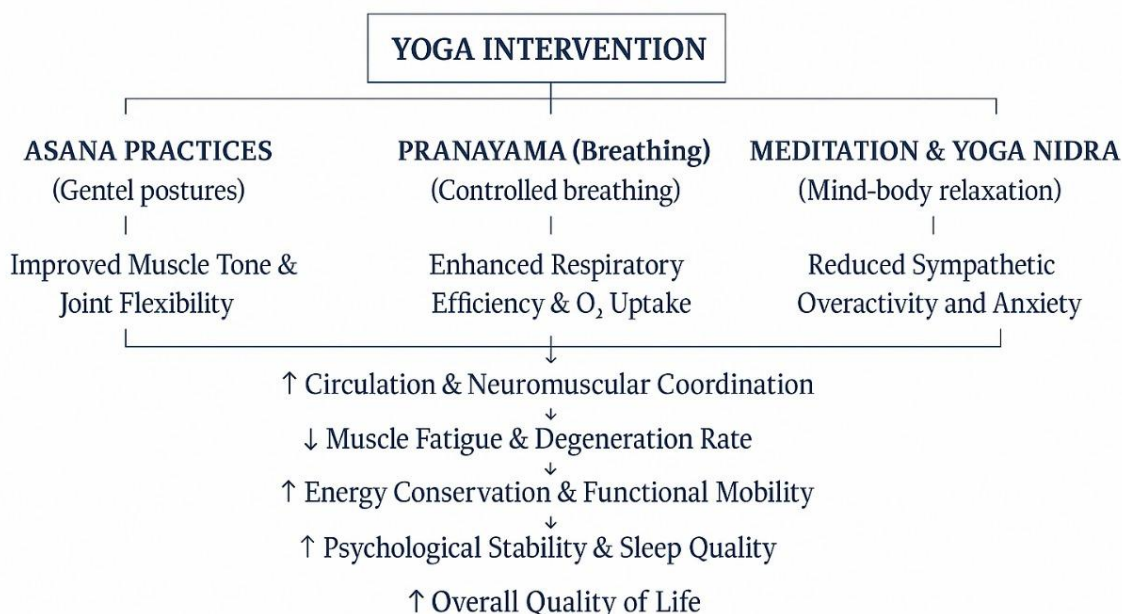
Anandamaya Kosha, the innermost bliss sheath, represents a state of profound peace and joy that transcends physical and mental suffering. In Muscular Dystrophy, when patients engage in Yoga Nidra or meditative chanting, this kosha becomes active, promoting emotional upliftment and inner contentment even amid physical challenges. Studies have shown that deep relaxation techniques, such as Yoga Nidra, improve psychological well-being and reduce stress responses [1]. Additionally, yoga practices enhance parasympathetic activity and emotional balance through neurochemical modulation [23].

Practice:

Karma Yoga: Performing daily activities with a selfless attitude and gratitude fosters inner peace and spiritual growth, reducing emotional suffering. [8,30].

The Integrated Approach to Yoga Therapy (IAYT), grounded in the Panchakosha model, provides a multi-dimensional framework for addressing the complex physical, physiological, psychological, cognitive, and emotional challenges associated with muscular dystrophy. By systematically targeting each kosha through graded asanas, pranayama, relaxation, meditation, mantra, and lifestyle disciplines, IAYT facilitates neuromuscular support, autonomic balance, emotional regulation, and adaptive coping. This integrative approach enables concurrent restoration of functional capacity and psychological resilience, thus offering a comprehensive adjunct to conventional rehabilitation aimed at improving overall quality of life.

Flow Chart: Shows how Yoga Works on Muscular Dystrophy



Note: Symbols used in the figure represent the direction of change, where (↑) denotes an increase and (↓) denotes a decrease in the respective outcomes.

5. Discussion: The IAYT framework is a logical fit for MD rehabilitation because it targets respiratory control, autonomic balance and psychosocial support in an individualized way. Current evidence, while limited, consistently reports feasibility and directionally positive effects on pulmonary function and aspects of mobility and quality of life in children with DMD and other muscle disorders. However, heterogeneity

and low power preclude definitive claims of effectiveness. High-quality, standardized RCTs with clear safety monitoring (cardiac and respiratory) are a priority [10].

6. Conclusion: Muscular Dystrophy, though incurable in modern medicine, can be managed more effectively through an integrative and compassionate approach. The IAYT model helps restore harmony at physical, energetic, mental, intellectual, and spiritual levels. Regular yoga practice improves posture, muscle tone, and emotional well-being, promoting acceptance and resilience. Yoga thus offers not just physical support but a humanistic approach to living with dignity and peace despite chronic conditions. Further clinical studies are recommended to validate these findings scientifically.

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