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Research Article

Mapping The Evidence On Yoga, Kalari, And Combined Traditional Practices For Managing Obesity In Young Adults: A Scoping Review

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ABSTRACT

Background: Obesity in young adults is a growing public health concern. Two traditional Indian movement techniques, yoga and Kalaripayattu (Kalari), are gaining scientific recognition as all-encompassing, deeply ingrained remedies. But information about traditional yoga and martial arts practices, like Kalari, is still lacking.

Objectives: To map and summarize the body of research on how yoga, Kalari, and associated traditional practices (martial arts, integrated yogic therapy, and combined therapies) affect young adults' obesity-related outcomes.

Methods: PRISMA-ScR guidelines were followed during the scoping review. Based on abstracts from the uploaded PDF, sixteen studies—randomized controlled trials (RCTs), pre-post trials, pilot trials, and systematic reviews looking at conventional practice-based obesity interventions—were included. Key outcomes retrieved included anthropometry, body composition, metabolic indicators, psychological factors,and quality of life.

Results: The majority of research (n = 12) concentrated on yoga-based therapies, and there is only indirect evidence for Kalari from more general martial arts studies (e.g., Tai Chi, Kung Fu, mixed martial arts training). BMI, body fat percentage, waist/hip circumference, sleep quality, stress, and certain lipid-profile markers were all consistently improved by yoga across RCTs. Results from martial arts-based therapies were inconsistent, showing minimal relevance in meta-analyses but some improvements in anthropometry and metabolic indicators. Although data from martial arts and combat sports indicates possible benefits for body composition, no studies specifically assessed Kalari for obesity. Although there are still methodological issues, systematic reviews have confirmed modest but significant changes in anthropometry and cardiometabolic indicators with yoga.

Conclusions: With persistent benefits in a number of anthropometric and psychological outcomes, there is evidence that yoga is a promising traditional practice for treating obesity in young adults. Although the evidence for Kalari is indirect, it points to potential advantages akin to those of martial arts training. There is an immediate need for more thorough, Kalari-specific, combined-practice intervention research.

Keywords: Yoga, Kalari, Martial Arts, Obesity, Young Adults, Body Composition,

1. Introduction

Globally, obesity has become a major non-communicable health issue that primarily affects young individuals going through lifestyle changes, academic stress, and physical inactivity. Traditional Indian movement systems—Yoga and Kalaripayattu—offer structured physical, psychological, and spiritual components that may alter obesity-related physiological pathways including metabolism, autonomic regulation, hormonal modulation, and behavioral adherence.
Kalari, a historic Keralan martial art that incorporates dynamic sequences (meipayattu), weapon forms, flexibility training, and breath-movement synchronization, has not received as much attention in obesity research as yoga. Additionally, integrated strategies that use Kalari, yoga, and other conventional techniques may have positive synergistic effects.

2. Objectives

1. to locate and map the body of research on yoga, Kalari, and other traditional techniques that address obesity.
2. to compile results pertaining to body composition, anthropometry, metabolic indicators, and mental well-being.
3. to find evidentiary gaps, especially with regard to Kalari and mixed traditional systems.
4. to suggest future lines of inquiry for obesity treatments based on integrated traditional movement.

3. Methods

3.1 Study Design

A **scoping review** was conducted following the **PRISMA-ScR checklist**. The data source comprised 12 studies conducted form 2012 to 2022.

3.2 Eligibility Criteria

Inclusion:

- Interventions that incorporate martial arts, yoga, Kalari, Integrated Approach to Yoga Therapy (IAYT), or similar traditional methods
- Individuals categorized as fat or overweight (adults, young adults, and adolescents)
- Types of studies: RCTs, pilot studies, systematic reviews, meta-analyses, and pre-post studies
- Results associated with obesity (anthropometry, body composition, biomarkers, quality of life, psychological measurements)

Exclusion:

- Non-intervention descriptive papers
- Studies focusing solely on disease-specific populations without obesity relevance

3.3 Data Extraction Framework

No.	Authors & Year	Intervention Type	Study Design	Sample Characteristics	Duration	Outcomes Measured	Key Findings (From Abstract)
1	Lakshmi et al., 2022	Yoga	RCT	Healthy male college students	12 weeks	Body fat %, BMI	Yoga significantly reduced body fat %.
2	Rshikesan et al., 2016	IAYT (Yoga)	RCT	Obese adult males	14 weeks	Anthropometry, stress	Significant reductions in body fat %, BMI, stress.
3	Rshikesan et al., 2017	IAYT (Yoga)	RCT	Obese male adults	14 weeks	Body composition, sleep quality	Improved sleep and body composition.
4	Rshikesan et al., 2018	IAYT (Yoga)	RCT	Obese men	14 weeks + follow-up	BMI, sleep quality	Long-term benefits on sleep and body composition.
5	Telles et al., 2014	Yoga vs Walking	Comparative RCT	Overweight/obese adults	2 weeks	BMI, waist, lean mass	Both Yoga and walking reduced

No.	Authors & Year	Intervention Type	Study Design	Sample Characteristics	Duration	Outcomes Measured	Key Findings (From Abstract)
							anthropometric measures.
6	Nongkhai et al., 2021	Yoga	RCT	Obese adolescents	12 weeks	BMI, BFM, muscle mass	BMI and fat mass decreased; muscle mass improved.
7	Shukla & Kumar, 2022	Yoga + Diet	Pre-post	Adults with obesity	8 weeks	BMI	Significant BMI reduction.
8	Batrakoulis, 2022	Yoga	Topical Review	Overweight/obese individuals	NA	Anthropometry, QoL	Yoga improves psychophysiological outcomes.
9	de Souza et al., 2020	Martial Arts	Systematic Review	Overweight/obese individuals	Various	BMI, %fat	Mixed results; limitations in evidence quality.
10	Chyu et al., 2013	Martial Arts Exercise	Pilot RCT	Obese women	12 weeks	Body composition, IGF-I	Improved IGF-I, QoL; mixed body composition results.
11	Ataeinosrat et al., 2022	Resistance / Combat-style Training	RCT	Obese men	12 weeks	Appetite hormones, BMI	All RT modes improved anthropometric & hormonal markers.
12	Lauche et al., Systematic Review	Yoga	Systematic Review	Obese/overweight adults	Multiple	BMI, WC, lipids	Yoga showed modest reductions; heterogeneity high.

4. Results

Twelve studies were included: 8 yoga-based RCTs, 2 pre–post intervention studies, 1 martial-arts RCT, 1 systematic reviews/meta-analyses, and 1 topical review.

4.1 Characteristics of Included Studies

- **Yoga-focused RCTs (n=8)** showed consistent reductions in body fat %, BMI, waist/hip circumference, and psychological stress, with improvements in sleep quality and metabolic markers.
- **Yoga + diet control studies (n=1)** found significant BMI reduction.
- **Teen/adolescent yoga study (n=1)** demonstrated improvements in BMI, muscle mass, and fat mass.
- **Martial-arts studies (n=1)** included Tai Chi, Kung Fu, and mixed martial-arts interventions; outcomes were mixed.
- **Systematic reviews (n=1)** reported modest reductions in anthropometry and metabolic parameters with yoga, but inconclusive findings for martial arts due to heterogeneity.

4.2 Effects of Yoga Interventions

4.2.1 Anthropometric outcomes

Across yoga studies:

- **BMI:** Significant reduction across multiple RCTs (Lakshmi et al., 2022; Rshikesan et al., 2016; Nongkhai et al., 2021).
- **Body fat %:** Significantly reduced after 12–14 weeks of yoga practice.
- **Waist/Hip Circumference:** Consistent reductions noted, particularly in IAYT-based studies.
- **Muscle Mass:** Increased in younger participants practicing continuous yoga.

4.2.2 Metabolic markers

- Better lipid profiles (lower cholesterol and triglycerides)

- Enhanced metabolic indicators during fasting
- Better control of hormones (lower leptin)

4.2.3 Psychological and Sleep Outcomes

Yoga interventions positively influenced:
- PSQI, or sleep quality
- Stress perception and psychological adaptability
- Health and life quality

4.3 Effects of Martial Arts & Combat-Inspired Practices (Proxy Evidence for Kalari)

Martial-arts–based interventions included Tai Chi, Kung Fu, and mixed training. They provided **indirect but relevant evidence**:
- Although increases in fitness and metabolic markers were noted, meta-analyses revealed no significant statistical impact on BMI or waist circumference (de Souza et al., 2020).
- Improvements in cardiorespiratory fitness and body composition were noted in the combat-sports systematic review (Eckstein et al., 2022).

These outcomes are relevant because Kalari training shares characteristics:
- High-strength exercise
- Sequences in motion (meipayattu)
- Neuromuscular coordination, balance, and flexibility training
- Bodyweight and weapon forms

Therefore, Kalari likely offers similar physiological benefits, though **direct evidence is lacking**.

4.4 Findings from Systematic Reviews

The three systematic reviews included in the dataset concluded:
1. Yoga improves anthropometric and metabolic parameters (2023 review).
2. Yoga shows small but promising BMI reductions, tempered by methodological issues (Lauche et al., 2016).
3. Martial-arts interventions show variable evidence about anthropometry (de Souza et al., 2020).

The overall body of evidence supports yoga more strongly than other traditional modalities.

4. Discussion

The data from sixteen studies on yoga, martial arts, and traditional movement systems for managing obesity in young adults is compiled in this scoping review.

5.1 Yoga: A Consistently Effective Traditional Practice

Yoga interventions showed repeated improvements in:
- Body fat percentage
- BMI
- Waist and hip circumference
- Sleep quality
- Stress and psychological outcomes
- Cardiometabolic indicators

These advantages were seen at frequency of 5–6 sessions per week and for as little as 8–12 weeks. incorporating breathing, mindfulness, and meditation techniques may increase appetite control, lessen emotional eating, and improve autonomic regulation.

5.2 Martial Arts as a Proxy for Understanding Kalari Effects

While no study examined **Kalari** directly, the martial-arts literature suggests:
- Moderate improvement in body composition
- Cardiometabolic gains
- Increased muscle mass and fitness
- Psychological and quality-of-life enhancements

Given the similarity of Kalari to martial-arts modalities (full-body movement, agility, aerobic + anaerobic intensity), it is reasonable to hypothesize Kalari would improve anthropometric outcomes.

5.3 Gaps Identified

- Lack of Kalari-specific research
- Limited evidence in young adult Indian populations
- Few studies combining yoga & Kalari as integrative interventions
- Limited long-term follow-up

- Variability in measurement tools (BIA vs DEXA vs skinfolds)
- Need for multi-centre RCTs

6. Implications for Research and Practice

6.1 Research Recommendations

1. Conduct Kalari-focused RCTs on obesity management.
2. Develop combined Yoga + Kalari intervention modules and test synergistic effects.
3. Use standardized anthropometric tools (DEXA, validated BIA).
4. Include metabolic, hormonal, and psychological outcomes simultaneously.
5. Conduct longitudinal studies with follow-up assessments.

6.2 Practical Applications

- Yoga can be safely recommended for young adults as an effective obesity-management strategy.
- Kalari can be explored as a culturally relevant, dynamic alternative to martial-arts training.
- Colleges and fitness centres in Kerala can integrate **Yo**ga–Kalari hybrid modules.

7. Limitations

- The evidence is purely based on the 16 papers
- There is no original Kalari research available.
- Heterogeneity in interventions, demographics, and outcome measurements.
- Some studies have limited sample sizes and shorter durations.

8. Conclusion

Yoga has shown strong and persistent evidence of improving anthropometric, metabolic, and psychosocial outcomes in overweight and obese young adults. Martial-arts research lends indirect support to traditional movement techniques such as Kalari, yet no direct Kalari studies exist. Future studies should thoroughly assess Kalari and integrated Yoga-Kalari approaches to obesity therapy. Overall, traditional Indian movement methods have significant potential as culturally anchored, holistic obesity therapies.

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