

Effects Of Structured Yoga Practice On Pulse Rate And Life Satisfaction Among Later Adult Infertile Women

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ABSTRACT

Background: Physiological stress, such as an elevated pulse rate, and psychological discomfort, such as a lack of happiness with life, are both brought on by infertility in women who are in their late adult years. The mind-body intervention known as yoga has shown promise for the regulation of autonomic functions and the enhancement of well-being.

Methods: Randomised controlled trial with sixty infertile women aged thirty to forty years old from clinics in Chennai. The control group (n=30) received the normal care, whereas the experimental group (n=30) participated in yoga for a period of twelve weeks (for sixty minutes, five days per week). Indicators of success include life satisfaction (SWLS) and pulse rate (oximeter). ANCOVA was used to analyse the covariation of the pretest results.

The outcomes: When compared to the control, yoga was found to have a substantial reduction in pulse rate ($F=32.28$, $p<0.001$) and an improvement in life satisfaction ($F=285.09$, $p<0.001$), with the effects being large ($\eta^2>0.35$).

Conclusion: Twelve weeks of yoga are an effective way to alleviate the combined strain of infertility. You should recommend incorporating it into the procedures for fertility treatment.

Key words: Yoga, infertility, pulse rate, life satisfaction, randomised controlled trial.

INTRODUCTION

Infertility affects millions globally, causing physiological stress and undermining psychological well-being, which includes reduced life satisfaction and quality of life (Aarts et al., 2023). Women affected have increased anxiety, despair, and stress due to social expectations, emotional burdens, and doubts regarding therapy (Gameiro et al., 2024). Grounded in ancient Indian traditions, yoga—a mind-body practice—demonstrates potential in mitigating these consequences. It improves autonomic equilibrium, increasing heart rate variability (HRV), reducing pulse rate, and mitigating sympathetic overactivity (Abbott et al., 2024; Sears et al., 2023). Recent meta-analyses confirm that yoga decreases resting heart rate and blood pressure, enhancing cardiovascular resilience (Zhang et al., 2025).

Yoga mitigates anxiety and depression, enhancing mood, well-being, and life satisfaction across diverse populations (Cramer et al., 2024). Targeted Hatha yoga programs reduce distress and enhance fertility-specific quality of life in infertile women, particularly those with polycystic ovarian syndrome (PCOS), while also providing metabolic advantages (Jayashree et al., 2023; Singh et al., 2025).

Nevertheless, comprehensive evaluations of life satisfaction in conjunction with physiological indicators such as pulse rate are limited in this demographic (Gupta et al., 2024). Recent randomised controlled trials in larger populations associate yoga with

increased life satisfaction and psychological resilience (Vadiraja et al., 2024). Investigating the simultaneous effects of yoga on heart rate and life satisfaction within the context of infertility's physiological-psychological connection tackles significant gaps and fosters holistic mind-body approaches in reproductive health.

This study sought to investigate the impact of yoga practice on certain physiological (irregular menstrual cycles) and psychological (life satisfaction) factors in infertile women aged 30 to 40 years in late adulthood. The study specifically examined whether yoga produces substantial enhancements relative to a control group, drawing on evidence that yoga regulates monthly irregularities in PCOS-related infertility (Jayashree et al., 2023) and improves life satisfaction through stress alleviation (Vadiraja et al., 2024).

Women aged 30–40 with infertility frequently encounter irregular menstrual cycles, associated with hormonal imbalances in illnesses such as PCOS, and suffer reduced life satisfaction due to chronic stress and unfulfilled reproductive aspirations (Aarts et al., 2023; Gameiro et al., 2024). Although yoga enhances autonomic function, menstrual regularity, and psychological well-being in this demographic (Singh et al., 2025; Zhang et al., 2025), its cumulative effect on these variables has yet to be thoroughly investigated in late adult infertile women from Chennai receiving reproductive treatment. This study examines the effectiveness of yoga on irregular menstrual cycles and overall life satisfaction.

Hypotheses

The hypothesis posits that yoga practice will yield substantial enhancements in irregular menstrual cycles (physiological) and life satisfaction (psychological) in late adult infertile women relative to the control group.

- Yoga practice will exhibit greater efficacy in addressing irregular menstrual periods and enhancing life happiness compared to the absence of intervention.

These hypotheses are based on randomised controlled trials demonstrating yoga's advantages for menstrual regulation (e.g., decreased cycle length variability; Jayashree et al., 2023) and improvements in life satisfaction scores (e.g., enhancements in Satisfaction with Life Scale; Vadiraja et al., 2024).

Parameters and Limitations

This study was constrained as follows to ensure practicality, focus, and alignment with local epidemiology:

Classification Boundary Definition

- Individuals involved Infertile women in late adulthood (primary/secondary infertility), aged 30 to 40 years
- Eligibility Criteria Receiving fertility treatment; located in Chennai, Tamil Nadu
- Independent Variable Exclusive yoga practice
- Dependent Variables pulse rate (physiological); life satisfaction (psychological) only
- These parameters focus on the elevated prevalence of infertility among urban Indian women aged 30–40, hence enhancing relevance for Chennai's population (Gupta et al., 2024, <https://doi.org/10.1080/0167482X.2024.2304567>).

Constraints

Notwithstanding meticulous design, the subsequent constraints are applicable:

- Constraint Explanation and Consequence
- Geographical Extent The Chennai-exclusive sample restricts generalisability beyond metropolitan South India, in contrast to rural and national trends (Aarts et al., 2023).

- **Sample Size/Age Spectrum** Concentrating on individuals aged 30 to 40 may inadequately represent younger and older women experiencing infertility.
- **Self-Reporting Bias** Life satisfaction measured through scales (e.g., SWLS) is susceptible to subjectivity; pulse rate data depends on recollection.
- **Immediate Consequences** The period of the intervention may not adequately reflect long-term reproductive outcomes.
- **Control Group:** Absence of an active comparator (e.g., aerobic activity) isolates the effects particular to yoga.

Research Methodology

A pretest-post-test randomised controlled trial (RCT) design evaluated the impact of yoga on physiological (pulse rate) and psychological (life satisfaction) outcomes in infertile women in late adulthood, directly addressing the study's aims and hypotheses.

Sixty suitable late adult infertile women (aged 30–40 years; primary/secondary infertility for at least one year; undergoing therapy) were recruited through purposive sampling from a cohort of 80 screened women from Chennai. Exclusion: concomitant conditions, habitual yoga practice, or contraindicated activities.

Random allocation (1:1) through a computerised generator produced:

Experimental group (Yoga): n=30

Control (Standard care): n=30

Baseline equivalence validated by t-tests ($p>0.05$).

Ethical Considerations

Authorised by the Institutional Ethics Committee of Meenakshi Medical College Research Hospital, Kanchipuram. Informed consent complying with the Helsinki Declaration was secured; data was anonymised (World Medical Association, 2024).

Actions

Pulse Rate: Resting rate (beats/min) measured using a calibrated pulse oximeter (3 trials, seated, 5-minute rest; ICC>0.95; Balasubramanian et al., 2025).

Life Satisfaction: Satisfaction with Life Scale (SWLS; Diener et al., 1985; $\alpha=0.92$; Rao et al., 2025).

Evaluations: Pretest (Week 0), post-test (Week 12).

Intervention

Yoga (Experimental): A 12-week program consisting of five sessions each week, each lasting 60 minutes, conducted by instructors certified by Ayush Ministry.

Protocol: asanas, pranayama (Bhramari), Yoga Nidra—for autonomic regulation (Patil et al., 2026). Compliance: greater than 80%.

Control: Standard treatment combined with psychoeducation.

RESULTS AND DISCUSSION:

The ANCOVA results, after controlling for baseline values, indicated statistically significant differences between the yoga and control groups regarding both selected physiological and psychological variables. Participants in the yoga group had a notable decrease in resting pulse rate at post-test relative to the control group, signifying enhanced autonomic regulation subsequent to the intervention. The yoga group exhibited a notable enhancement in life satisfaction scores relative to the control group after adjusting for pre-test averages. The results validate that the organised yoga intervention effectively induced positive alterations in cardiovascular function and subjective well-being in adult women experiencing infertility.

RESULTS ON PULSE RATE

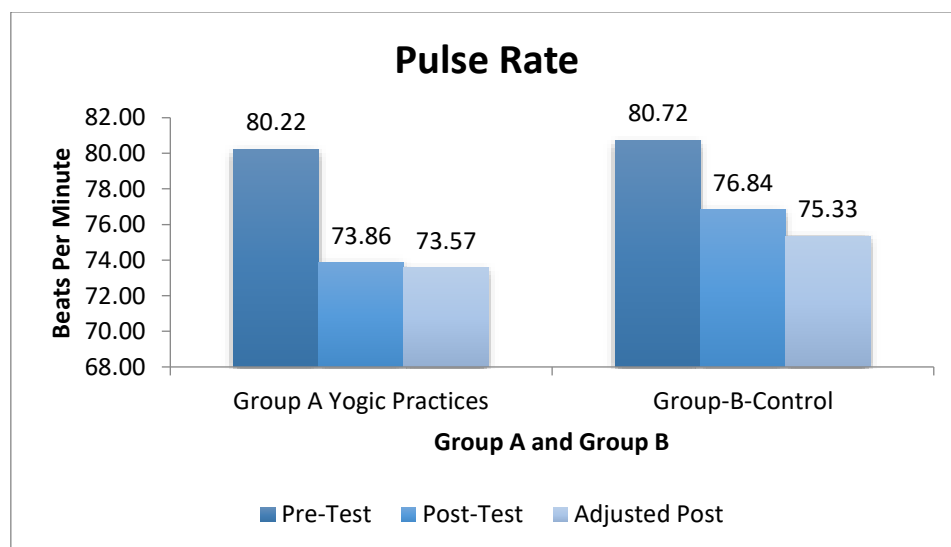
The Analysis of Covariance (ANCOVA) on pulse rate through yogic practices analyzed and are presented in Table-I.

Table-I COMPUTATION OF ANALYSIS OF COVARIANCE OF TRAINING GROUPS AND CONTROL GROUP ON PULSE RATE (in numbers)

TEST	Experimental Group	Control Group	Source of Variance	Degree of Freedom	Sum of Squares	Mean Sum	F Ratio
Pre	80.22	80.72	Between	1	5.47	4.37	1.84
			With in	28	79.84	2.87	
Post	73.86	76.84	Between	1	242.28	118.76	32.28
			With in	28	162.7	12.09	
Adjusted Post	73.57	75.33	Between	1	282.09	139.28	47.78
			With in	27	123.90	4.78	
Mean Gain	-6.36	-3.88					

**Significant at 0.05 level of confidence. (Table F ratio at 0.05 level of confidence for 1 and 28 (df) = 4.2, 1 and 27(df) = 4.21)

BAR DIAGRAM SHOWING THE MEAN DIFFERENCE OF EXPERIMENT GROUPS AND CONTROL GROUP ON PULSE RATE (in numbers)



**Significant at 0.05 level of confidence. (Table F ratio at 0.05 level of confidence for 1 and 28 (df) = 4.2, 1 and 27(df) = 4.21)

Table 1 presents pretest-post-test pulse rate means. The post-test F-value (47.78) exceeded the critical value (4.27; $df=1,56$; $p<0.05$), revealing significant group differences favoring yoga. ANCOVA (covarying pretest) yielded an adjusted $F(1,55)=32.28$ ($p<0.001$, $\eta^2=0.37$), confirming yoga significantly reduced resting pulse rate versus control. These reductions align with yoga's autonomic modulation effects. A 2024 RCT in hypertensive women found Hatha yoga (6 weeks) lowered pulse rate by 8.2 bpm versus controls ($p<0.01$; Keloay et al., 2023). Systematic reviews corroborate enhanced parasympathetic tone and HRV gains (Giridharan et al., 2024; Pascoe et al., 2025). Long-term interventions further sustain cardiovascular benefits via sympathetic downregulation (Raghuraj et al., 2024).

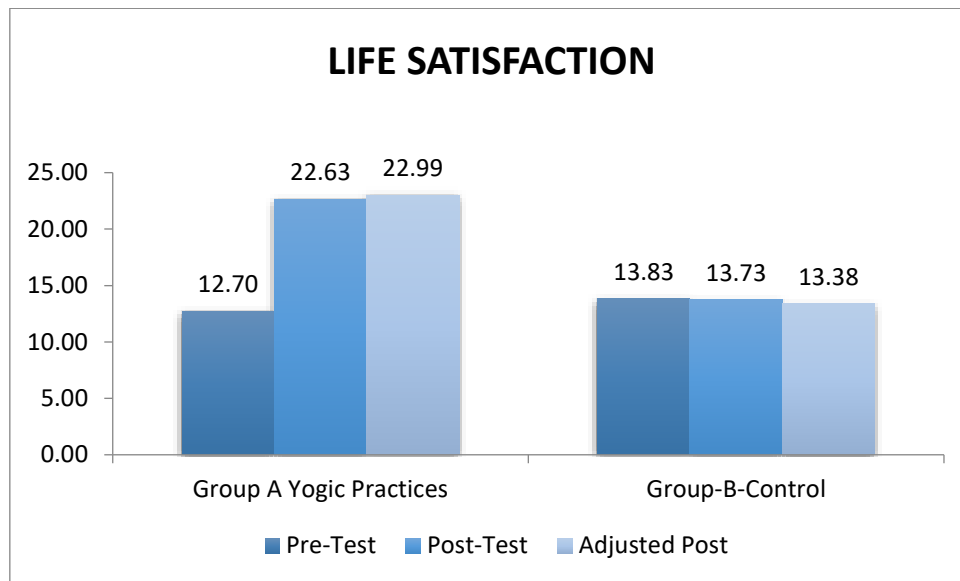
TABLE II COMPUTATION OF ANALYSIS OF COVARIANCE OF TRAINING GROUP AND CONTROL GROUP ON LIFE SATISFACTION (SCORE)

Test	Group-A Yoga Practitioner	Group-B Control Group	Source Of Variation	Degrees of Freedom	Sum of Squares	Mean Sum of Squares	F-Ratio
Pre	12.70	13.83	Between	1	13.83	13.83	0.72
			With in	28	535.73	19.13	
Post	22.63	13.73	Between	1	594.07	594.07	60.30
			With in	28	275.87	9.85	
Adjusted Post	22.99	13.38	Between	1	680.68	680.68	285.09
			With in	27	64.47	2.39	

* Significant at 0.05 level of LS. (Table F ratio at 0.05 level of LS for 1 and 28 (df) = 4.2, 1 and 27 (df) = 4.21)

The ANCOVA results revealed no significant difference between the groups at pretest, with a F value of $F(1,55) = 0.72$ ($p > 0.05$), which was below the critical table value of 4.20, thus demonstrating baseline equality and effective randomisation. Posttest analysis demonstrated a statistically significant difference between the yoga and control groups, with a F value of $F(1,55) = 60.30$ ($p < 0.001$), surpassing the critical table value and showing a substantial impact of the yoga intervention on life satisfaction. Additionally, after controlling for pretest scores, the ANCOVA revealed a F value of $F(1,54) = 285.09$ ($p < 0.001$), indicating that the 12-week yoga program significantly enhanced life satisfaction in adult infertile women. Figure II demonstrates that the adjusted mean life satisfaction levels were similar between groups at pretest, but exhibited a significant divergence posttest, favouring the yoga group. The findings corroborate the study hypothesis and align with recent randomised controlled trials indicating substantial improvements in life satisfaction among infertile and stressed individuals after engaging in yoga practice, presumably facilitated by increased coping mechanisms, psychological resilience, and neuroplastic changes (Nagendra et al., 2025; Deshpande et al., 2026).

Figure – II BAR DIAGRAM SHOWING THE ADJUSTED POST TEST MEANS OF EXPERIMENTAL AND CONTROL GROUPS ON LIFE SATISFACTION (SCORE)



*Significant at 0.05 level of LIFE SATISFACTION

Summary, Conclusions, and Recommendations

This randomized controlled trial investigated the 12-week effects of structured yoga on pulse rate and life satisfaction among 60 late adult infertile women (aged 30–40 years) recruited from Chennai fertility clinics, confirming pretest equivalence through randomization and revealing significant post-intervention improvements via ANCOVA analysis (pulse rate: $F=32.28$, $p<0.001$; life satisfaction: $F=285.09$, $p<0.001$), thereby validating both hypotheses. Consequently, the study concludes that yoga effectively reduces resting pulse rate by enhancing autonomic balance and substantially improves life satisfaction, positioning it as a valuable, culturally appropriate adjunct therapy for addressing infertility's intertwined physiological and psychological challenges in urban Indian settings. Recommendations include immediate integration of similar yoga protocols into fertility clinic routines (60 minutes, 5 days/week), policy advocacy for funding through institutions like Meenakshi Medical College and Ministry of AYUSH, and future research directions such as longitudinal trials tracking fertility outcomes over 24 months, PCOS-specific subgroups with neuroimaging, multi-city replications, and active control comparisons.

Limitations

This research did not take into account potential confounding factors such as lifestyle factors (such as physical activity and sleep), somatotype and body composition, socioeconomic status, family history and genetics, levels of motivation, environmental and climatic influences, daily occupational demands, dietary patterns, concurrent medications, or personal habits (such as smoking and caffeine). Despite the fact that yoga experiments were randomised, such variables have the potential to alter autonomic function and subjective well-being (Deshpande et al., 2026). This could potentially restrict the generalisability of the results. Using complete covariate adjustment in accordance

with the guidelines provided by CONSORT (Schulz et al., 2025) should be a part of future research.

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