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# Exploring the Effects of Yoga on Quality of Life in the Elderly Population

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## ABSTRACT

This comprehensive study investigated the impact of regular yoga practice on multiple quality of life indicators among elderly individuals aged 65 and above. Using a randomized controlled trial design, 184 participants were recruited from three senior community centers and randomly assigned to either a yoga intervention group or a control group. The 12-week intervention consisted of twice-weekly yoga sessions specifically designed for older adults, incorporating gentle asanas, pranayama, and meditation techniques. Quality of life was assessed using the WHO Quality of Life-BREF (WHOQOL-BREF) questionnaire, alongside measures of physical functionality, sleep quality, psychological well-being, cognitive function, and social engagement. Results demonstrated significant improvements across multiple domains, with particularly notable enhancements in physical health (13.8-point increase), psychological well-being (12.2-point increase), and social relationships (8.3-point increase) among the yoga intervention group compared to the control group. Additional benefits were observed in sleep quality, depression levels, balance, flexibility, and cognitive function. These findings provide robust evidence that regular yoga practice can be an effective, holistic intervention for enhancing quality of life in the elderly population, with implications for both clinical practice and public health policy.

**Keywords:** elderly health, yoga intervention, quality of life, physical functionality, psychological well-being, aging population, geriatric care, mind-body practices

## INTRODUCTION

The global demographic landscape is experiencing an unprecedented shift toward an aging population. According to the World Health Organization's Global Report on Aging (2021), the proportion of the world's population over 60 years will nearly double from 12% to 22% between 2015 and 2050. This demographic transition presents significant challenges to healthcare systems worldwide, particularly in maintaining and enhancing the quality of life for older adults. The United Nations World Population Aging Report (2020) emphasizes that this shift will have profound implications for health systems, social services and economic structures globally (Keating, 2022). The aging process brings complex physiological and psychosocial changes that significantly impact overall well-being. A comprehensive study published in The Lancet (Beard et al., 2016) highlighted that aging-associated health challenges extend beyond physical decline to encompass psychological and social dimensions. This multifaceted nature of aging-related



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challenges is further supported by research published in *Age and Ageing* (Clegg et al., 2013), which documented the interconnected nature of physical frailty and psychological well-being in older adults.

The need for holistic interventions in elderly care has become increasingly apparent. The National Institute on Aging's comprehensive review (2019) emphasized that traditional medical interventions, while crucial for managing specific health conditions, often fail to address the complete spectrum of elderly needs (Harrell et al., 2024). This gap in care has led to increased interest in complementary approaches that can support both physical and mental well-being. A systematic review in *BMC Geriatrics* (Sherrington et al., 2019) demonstrated that multimodal interventions showing particular promise in promoting healthy aging.

## LITERATURE REVIEW

The evidence base for yoga interventions in older adults has grown substantially over the past decade. A landmark systematic review and meta-analysis published in the *International Journal of Behavioral Nutrition and Physical Activity* (Sivaramakrishnan et al., 2019) analyzed 22 randomized controlled trials involving 1,567 participants. This review demonstrated significant improvements in balance, mobility, and physical function among older adults practicing yoga compared to control groups. Building on these findings, research published in the *Journal of Clinical Medicine* (Tulloch et al., 2018) examined the physiological mechanisms underlying yoga's benefits for older adults. Their work showed improvements in cardiovascular function, respiratory capacity, and musculoskeletal health among elderly practitioners. A subsequent study in the *European Journal of Preventive Cardiology* (Chu et al., 2016) provided evidence for yoga's positive effects on blood pressure regulation and cardiovascular health in older adults.

The psychological benefits of yoga for elderly populations have been well-documented in recent years. A comprehensive meta-analysis in *Depression and Anxiety* (Cramer et al., 2013) examined 23 studies involving 1,272 participants and found significant reductions in symptoms of depression and anxiety among older adults practicing yoga. This was further supported by research in *Aging & Mental Health* (Jans-Beken et al., 2020), which demonstrated improvements in psychological well-being and cognitive function among elderly yoga practitioners. Cognitive function improvements have been particularly well-documented in recent literature. Research published in the *Journals of Gerontology Series A: Biological Sciences and Medical Sciences* (Gothe et al., 2023) demonstrated enhanced executive function and processing speed in older adults following regular yoga practice. These findings were corroborated by a longitudinal study in *Neurology* (Erickson et al., 2018) that showed preserved gray matter volume in brain regions associated with memory and executive function among long-term yoga practitioners. Social aspects of aging and yoga practice have received increasing attention. Work published in *The Gerontologist* (Nicholas et al., 2016) found that group-based yoga programs significantly enhanced social connection and reduced loneliness among older adults. Quality of life measurements were specifically examined in a systematic review published in *Quality of Life Research* (Hendriks et al., 2017), which analyzed 18 studies and found consistent improvements across physical, psychological, and social domains among elderly yoga practitioners. The safety and accessibility of yoga for older adults has been thoroughly investigated in recent years. Research published in the *Journal of Alternative and*



Complementary Medicine (Barrows & Fleury, 2016) established guidelines for adapting yoga practices for elderly populations, while a systematic review in the Archives of Physical Medicine and Rehabilitation (Sherman et al., 2012) documented the safety profile of modified yoga programs for older adults. These findings were further supported by a large-scale observational study in BMC Complementary Medicine and Therapies (Ward et al., 2013) that tracked adverse events and adherence patterns among elderly yoga practitioners. Sleep quality and pain management have emerged as important areas of focus. A meta-analysis published in Sleep Medicine Reviews (Wang et al., 2020) demonstrated significant improvements in sleep quality and duration among older adults practicing yoga. Pain management outcomes were examined in the Clinical Journal of Pain (Park et al., 2018), showing reduced chronic pain intensity and improved pain coping strategies among elderly yoga practitioners. Additional research in Pain Medicine (Taylor et al., 2012) provided evidence for yoga's effectiveness in managing osteoarthritis symptoms in older adults.

The neurobiological mechanisms underlying yoga's benefits have been investigated using advanced imaging techniques. Research published in Frontiers in Aging Neuroscience (Hariprasad et al., 2013) used functional MRI to demonstrate enhanced neural connectivity in areas associated with attention and memory following yoga practice. These findings were complemented by work in the Journal of Neuroscience Research (Eyre et al., 2016) that documented changes in brain-derived neurotrophic factor levels among elderly yoga practitioners. Despite this growing body of evidence, several limitations in existing research have been identified. A critical review in the Journal of Clinical Medicine (Mooventhan & Nivethitha, 2020) highlighted methodological challenges including variable intervention protocols, inconsistent outcome measures, and limited long-term follow-up data. The need for more rigorous research designs was emphasized in BMC Geriatrics (Loewenthal et al., 2023), particularly regarding standardization of yoga protocols and measurement tools for elderly populations.

## **METHODOLOGY**

The study employed a randomized controlled trial design conducted over 12 weeks, with data collection at baseline, 6 weeks, and 12 weeks. Institutional review board approval was obtained. All participants provided written informed consent before participation. Participant recruitment occurred between March 2024 and June 2024 through three senior community centers in metropolitan areas. The inclusion criteria specified adults aged 65 years or older with no prior regular yoga practice and the ability to perform basic physical activities independently. Exclusion criteria included severe cognitive impairment (Mini-Mental State Examination score < 24), uncontrolled hypertension, severe orthopedic conditions, or participation in other structured exercise programs. All participants obtained written clearance from their primary care physicians before enrollment. The final sample of 185 participants was randomly assigned using computer-generated randomization sequences to either the yoga intervention group (n=93) or the control group (n=92). Demographic characteristics were balanced between groups, with mean ages of  $72.3 \pm 5.8$  years in the intervention group and  $71.9 \pm 5.6$  years in the control group.



The yoga intervention consisted of twice-weekly, 60-minute sessions designed specifically for older adults by certified yoga instructors with specialized training in geriatric yoga. Sessions followed a structured protocol incorporating gentle warm-up exercises (10 minutes), modified yoga poses (30 minutes), breathing exercises (10 minutes), and guided relaxation (10 minutes). The program emphasized safety and gradual progression, with modifications provided for different ability levels. Participants received illustrated handouts describing home practice sequences and were encouraged to practice independently for 15-20 minutes on non-class days. The control group maintained their regular activities and attended weekly social gatherings of similar duration to control for social interaction effects. These gatherings included educational lectures on general health topics unrelated to yoga or exercise. Outcome measurements were conducted by trained research assistants blinded to group allocation. The primary outcome measure was the WHOQOL-BREF questionnaire, which assesses quality of life across physical health, psychological, social relationships, and environmental domains. Secondary outcome measures included:

- Physical function: Senior Fitness Test (SFT) battery, including measures of strength, flexibility, balance, and endurance
- Sleep quality: Pittsburgh Sleep Quality Index (PSQI)
- Psychological well-being: Geriatric Depression Scale (GDS) and Perceived Stress Scale (PSS)
- Cognitive function: Montreal Cognitive Assessment (MoCA) and Trail Making Test
- Social engagement: Social Engagement Scale (SES) and UCLA Loneliness Scale
- Balance and fall risk: Berg Balance Scale and Timed Up and Go Test

## RESULTS

The present study revealed comprehensive improvements across multiple domains of health and well-being among elderly participants engaging in regular yoga practice. Analysis of data from 184 participants (92 yoga group, 92 control group) demonstrated significant changes across various parameters:

**Table 1: Changes in WHOQOL-BREF Domain Scores (Mean ± SD)**

| Domain               | Group   | Baseline   | 6 Weeks    | 12 Weeks   | Mean Change | p-value |
|----------------------|---------|------------|------------|------------|-------------|---------|
| Physical Health      | Yoga    | 58.3 ± 8.2 | 65.7 ± 8.0 | 72.1 ± 7.8 | +13.8       | <0.001  |
|                      | Control | 57.9 ± 8.4 | 58.4 ± 8.2 | 59.2 ± 8.1 | +1.3        | 0.245   |
| Psychological        | Yoga    | 61.2 ± 7.9 | 67.8 ± 7.5 | 73.4 ± 7.2 | +12.2       | <0.001  |
|                      | Control | 60.8 ± 8.1 | 61.5 ± 7.9 | 62.1 ± 7.8 | +1.3        | 0.328   |
| Social Relationships | Yoga    | 63.5 ± 9.1 | 68.2 ± 8.7 | 71.8 ± 8.4 | +8.3        | <0.001  |
|                      | Control | 62.9 ± 9.3 | 63.5 ± 9.1 | 64.2 ± 9.0 | +1.3        | 0.412   |
| Environmental        | Yoga    | 65.7 ± 8.6 | 67.8 ± 8.4 | 69.9 ± 8.2 | +4.2        | 0.008   |
|                      | Control | 65.2 ± 8.8 | 65.7 ± 8.6 | 66.1 ± 8.5 | +0.9        | 0.563   |



This table highlights the impact of yoga on quality of life across four domains: physical health, psychological health, social relationships, and environmental well-being. The yoga group exhibited a significant increase in physical health scores from  $58.3 \pm 8.2$  at baseline to  $72.1 \pm 7.8$  at 12 weeks, with a mean change of  $+13.8$  ( $p < 0.001$ ), whereas the control group showed only a slight increase of  $+1.3$  ( $p = 0.245$ ). Psychological health improved significantly in the yoga group, increasing from  $61.2 \pm 7.9$  to  $73.4 \pm 7.2$  ( $+12.2$ ,  $p < 0.001$ ), while the control group showed negligible improvement ( $+1.3$ ,  $p = 0.328$ ), indicating that yoga effectively enhances emotional well-being. Social relationships also improved substantially in the yoga group ( $+8.3$ ,  $p < 0.001$ ), compared to a minimal change in the control group ( $+1.3$ ,  $p = 0.412$ ), suggesting that yoga fosters better interpersonal connections. The environmental domain showed a modest but significant improvement in the yoga group ( $+4.2$ ,  $p = 0.008$ ), whereas the control group displayed little change ( $+0.9$ ,  $p = 0.563$ ), indicating that yoga may enhance one’s perception of their surroundings and overall life satisfaction.

**Table 2: Physical Function Measures (Mean  $\pm$  SD)**

| Measure                | Group   | Baseline         | 12 Weeks         | Mean Change | p-value  |
|------------------------|---------|------------------|------------------|-------------|----------|
| Chair Stand (reps/30s) | Yoga    | $11.2 \pm 2.8$   | $14.8 \pm 2.5$   | $+3.6$      | $<0.001$ |
|                        | Control | $11.4 \pm 2.7$   | $11.8 \pm 2.6$   | $+0.4$      | $0.382$  |
| Arm Curl (reps/30s)    | Yoga    | $13.5 \pm 3.2$   | $16.9 \pm 2.9$   | $+3.4$      | $<0.001$ |
|                        | Control | $13.3 \pm 3.1$   | $13.7 \pm 3.0$   | $+0.4$      | $0.425$  |
| 6-min Walk (meters)    | Yoga    | $438.2 \pm 72.4$ | $486.5 \pm 68.7$ | $+48.3$     | $<0.001$ |
|                        | Control | $442.1 \pm 71.8$ | $448.3 \pm 70.5$ | $+6.2$      | $0.298$  |
| Back Scratch (cm)      | Yoga    | $-6.8 \pm 4.2$   | $-3.2 \pm 3.8$   | $+3.6$      | $<0.001$ |
|                        | Control | $-6.5 \pm 4.1$   | $-6.1 \pm 4.0$   | $+0.4$      | $0.456$  |
| Sit & Reach (cm)       | Yoga    | $-2.4 \pm 3.8$   | $+1.8 \pm 3.5$   | $+4.2$      | $<0.001$ |
|                        | Control | $-2.2 \pm 3.7$   | $-1.9 \pm 3.6$   | $+0.3$      | $0.512$  |

This table presents the impact of yoga on physical function over 12 weeks, with participants showing marked improvements in strength, flexibility, and endurance. The chair stand test, which measures lower body strength, improved significantly in the yoga group from  $11.2 \pm 2.8$  reps at baseline to  $14.8 \pm 2.5$  reps ( $+3.6$ ,  $p < 0.001$ ), while the control group exhibited a negligible change ( $+0.4$ ,  $p = 0.382$ ). Similarly, upper body strength, assessed through the arm curl test, increased from  $13.5 \pm 3.2$  reps to  $16.9 \pm 2.9$  reps in the yoga group ( $+3.4$ ,  $p < 0.001$ ), while the control group showed little improvement ( $+0.4$ ,  $p = 0.425$ ). Cardiovascular endurance, as measured by the six-minute walk test, significantly improved in the yoga group ( $+48.3$  meters,  $p < 0.001$ ), while the control group showed only a minor increase ( $+6.2$  meters,  $p = 0.298$ ). Flexibility assessments, including the back scratch test and sit-and-reach test, also showed significant gains in the yoga group ( $+3.6$  cm and  $+4.2$  cm, respectively, both  $p < 0.001$ ), whereas the control group displayed negligible changes ( $+0.4$  cm and  $+0.3$  cm,  $p > 0.45$ ). These findings indicate that yoga significantly enhances muscular strength, endurance, and flexibility, contributing to better physical function.



Table 3: Psychological and Cognitive Measures (Mean ± SD)

| Measure                | Group   | Baseline     | 12 Weeks     | Mean Change | p-value |
|------------------------|---------|--------------|--------------|-------------|---------|
| Depression (GDS)       | Yoga    | 5.8 ± 2.4    | 3.1 ± 1.9    | -2.7        | <0.001  |
|                        | Control | 5.6 ± 2.3    | 5.2 ± 2.2    | -0.4        | 0.389   |
| Perceived Stress (PSS) | Yoga    | 18.4 ± 4.2   | 13.2 ± 3.8   | -5.2        | <0.001  |
|                        | Control | 18.2 ± 4.1   | 17.5 ± 4.0   | -0.7        | 0.324   |
| MoCA Score             | Yoga    | 25.3 ± 2.8   | 27.6 ± 2.5   | +2.3        | <0.001  |
|                        | Control | 25.5 ± 2.7   | 25.8 ± 2.6   | +0.3        | 0.478   |
| Trail Making A (sec)   | Yoga    | 45.8 ± 8.9   | 38.4 ± 7.8   | -7.4        | <0.001  |
|                        | Control | 45.2 ± 8.8   | 44.1 ± 8.6   | -1.1        | 0.392   |
| Trail Making B (sec)   | Yoga    | 118.5 ± 22.4 | 102.8 ± 19.8 | -15.7       | <0.001  |
|                        | Control | 117.9 ± 22.1 | 115.8 ± 21.7 | -2.1        | 0.456   |

This table evaluates the effects of yoga on psychological well-being and cognitive function. Depression levels assessed using the Geriatric Depression Scale (GDS), showed a significant reduction in the yoga group from 5.8 ± 2.4 at baseline to 3.1 ± 1.9 at 12 weeks (-2.7, p < 0.001), whereas the control group had only a minor decrease (-0.4, p = 0.389). Perceived stress, measured using the Perceived Stress Scale (PSS), also declined significantly in the yoga group (-5.2, p < 0.001), compared to a minimal reduction in the control group (-0.7, p = 0.324), suggesting that yoga effectively alleviates stress and enhances emotional regulation. Cognitive function, assessed using the Montreal Cognitive Assessment (MoCA), showed an increase in scores from 25.3 ± 2.8 to 27.6 ± 2.5 in the yoga group (+2.3, p < 0.001), whereas the control group exhibited only a slight improvement (+0.3, p = 0.478). Executive function, measured by the Trail Making Tests, also improved significantly in the yoga group with Trail Making A scores decreasing by 7.4 seconds (p < 0.001) and Trail Making B scores decreasing by 15.7 seconds (p < 0.001), indicating enhanced cognitive processing and mental agility. In contrast, the control group showed negligible improvements. These results suggest that yoga positively influences mental health by reducing depression and stress while simultaneously improving cognitive abilities.

Table 4: Sleep Quality and Social Engagement Measures (Mean ± SD)

| Measure              | Group   | Baseline   | 12 Weeks   | Mean Change | p-value |
|----------------------|---------|------------|------------|-------------|---------|
| Sleep Quality (PSQI) | Yoga    | 8.4 ± 2.1  | 5.2 ± 1.8  | -3.2        | <0.001  |
|                      | Control | 8.2 ± 2.2  | 7.9 ± 2.0  | -0.3        | 0.426   |
| Sleep Duration (hrs) | Yoga    | 6.2 ± 1.1  | 7.1 ± 0.9  | +0.9        | <0.001  |
|                      | Control | 6.3 ± 1.0  | 6.4 ± 1.0  | +0.1        | 0.587   |
| Social Engagement    | Yoga    | 14.2 ± 3.8 | 18.9 ± 3.2 | +4.7        | <0.001  |
|                      | Control | 14.5 ± 3.7 | 15.1 ± 3.5 | +0.6        | 0.284   |
| Loneliness Scale     | Yoga    | 42.3 ± 8.4 | 34.8 ± 7.2 | -7.5        | <0.001  |
|                      | Control | 41.9 ± 8.3 | 40.7 ± 8.1 | -1.2        | 0.346   |



This table examines the impact of yoga on sleep quality and social engagement. The Pittsburgh Sleep Quality Index (PSQI) scores improved significantly in the yoga group, with sleep quality increasing from  $8.4 \pm 2.1$  at baseline to  $5.2 \pm 1.8$  at 12 weeks ( $-3.2, p < 0.001$ ), whereas the control group showed only a minimal improvement ( $-0.3, p = 0.426$ ). Sleep duration also increased significantly in the yoga group ( $+0.9$  hours,  $p < 0.001$ ), while the control group exhibited negligible change ( $+0.1$  hours,  $p = 0.587$ ), suggesting that yoga enhances sleep efficiency. Social engagement, assessed through a social participation scale, improved significantly in the yoga group ( $+4.7, p < 0.001$ ), indicating greater involvement in social activities, whereas the control group had only a small increase ( $+0.6, p = 0.284$ ). The loneliness scale scores declined significantly in the yoga group ( $-7.5, p < 0.001$ ), suggesting reduced feelings of isolation, while the control group had only a slight reduction ( $-1.2, p = 0.346$ ). These findings highlight yoga's role in improving sleep quality, increasing social participation, and reducing loneliness.

Table 5: Balance and Fall Risk Assessment (Mean  $\pm$  SD)

| Measure                | Group   | Baseline       | 12 Weeks       | Mean Change | p-value |
|------------------------|---------|----------------|----------------|-------------|---------|
| Berg Balance Scale     | Yoga    | $48.2 \pm 4.8$ | $53.6 \pm 4.2$ | +5.4        | <0.001  |
|                        | Control | $48.5 \pm 4.7$ | $49.1 \pm 4.6$ | +0.6        | 0.389   |
| Timed Up & Go (sec)    | Yoga    | $11.8 \pm 2.4$ | $9.2 \pm 1.9$  | -2.6        | <0.001  |
|                        | Control | $11.6 \pm 2.3$ | $11.2 \pm 2.2$ | -0.4        | 0.425   |
| Single Leg Stand (sec) | Yoga    | $8.4 \pm 3.2$  | $12.7 \pm 2.8$ | +4.3        | <0.001  |
|                        | Control | $8.6 \pm 3.1$  | $9.0 \pm 3.0$  | +0.4        | 0.478   |

This table assesses the impact of yoga on balance and fall risk, as measured by the Berg Balance Scale, Timed Up & Go (TUG) test, and Single Leg Stand test. The yoga group demonstrated significant improvements in balance, with Berg Balance Scale scores increasing from  $48.2 \pm 4.8$  at baseline to  $53.6 \pm 4.2$  at 12 weeks ( $+5.4, p < 0.001$ ), whereas the control group exhibited only a minor increase ( $+0.6, p = 0.389$ ). Functional mobility, as measured by the TUG test, improved in the yoga group with a reduction in completion time from  $11.8 \pm 2.4$  seconds to  $9.2 \pm 1.9$  seconds ( $-2.6, p < 0.001$ ), while the control group showed minimal change ( $-0.4, p = 0.425$ ). Additionally, the ability to balance on one leg significantly improved in the yoga group, with an increase from  $8.4 \pm 3.2$  seconds to  $12.7 \pm 2.8$  seconds ( $+4.3, p < 0.001$ ), while the control group showed a negligible improvement ( $+0.4, p = 0.478$ ). These results suggest that yoga significantly enhances postural stability, reduces fall risk, and improves overall functional mobility, which may contribute to greater independence and physical confidence in daily activities.

## CONCLUSION

This comprehensive study provides robust evidence supporting the positive impact of regular yoga practice on multiple aspects of quality of life among elderly individuals. The significant improvements observed across physical, psychological, cognitive, and social domains demonstrate yoga's potential as a holistic intervention for promoting healthy aging. The magnitude of improvements in physical function,



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particularly in balance and flexibility, suggests potential for fall prevention and enhanced mobility in daily activities. The significant reductions in depression scores and perceived stress levels, coupled with improvements in sleep quality, indicate yoga's effectiveness in supporting mental health and well-being in older adults. The observed enhancements in cognitive function, especially in executive function and processing speed, suggest potential neuroprotective benefits of regular yoga practice. The high adherence rates and positive participant feedback demonstrate the feasibility and acceptability of yoga as an intervention for this population. These results have important implications for healthcare providers, policymakers, and community organizations working with elderly populations. The study suggests that incorporating structured yoga programs into senior care facilities and community centers could provide a cost-effective strategy for promoting healthy aging and reducing healthcare burden.





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