ORIGINAL ARTICLE

Effects of yoga on balance and shoulder mobility in university students: a randomized controlled trial

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Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Abstract

Background and Study Aim Yoga has been increasingly recognized as a form of physical activity that enhances both physical and psychological well-being. It integrates postures, breathing control, and concentration, contributing to flexibility, strength, and balance. Despite the availability of various exercise methods for improving postural control and joint mobility, their relative effectiveness in enhancing balance and shoulder mobility among young adults remains a subject of practical interest. Therefore, this study aimed to examine the effects of an eight-week yoga program on balance and shoulder mobility in university students.

Material and Methods Forty healthy participants over the age of 18 who had never practiced yoga regularly took part in the study. Baseline measurements included height, weight, body mass index (BMI), body fat percentage, and leg length, followed by assessments of shoulder mobility and static and dynamic balance. The yoga intervention was conducted once a week for one hour over eight weeks. Statistical analyses were performed using IBM SPSS 24.0 for Windows. For normally distributed data, Independent Samples t-tests and Paired Samples t-tests were used, while Mann–Whitney U and Wilcoxon tests were applied to non-normal data. The level of statistical significance was set at $p < 0.05$.

Results There were no significant differences between the training and control groups in pre-test measurements ($p > 0.05$). In contrast, post-test comparisons revealed significant improvements in several components of dynamic balance in the training group, including right posterolateral, right composite, left anterior, left posterolateral, and left composite reach directions ($p < 0.05$). Within-group analysis also indicated meaningful gains in static balance and bilateral shoulder mobility in participants who completed the yoga intervention, while no significant changes were observed in the control group.

Conclusions The results of this trial demonstrate that an eight-week structured yoga program can effectively enhance both static and dynamic balance as well as shoulder mobility in university students without prior yoga experience. These findings support the inclusion of yoga as a practical, accessible, and holistic training method for promoting postural stability, flexibility, and overall functional performance in young adults.

Keywords: yoga, static balance, dynamic balance, shoulder, mobility.

Introduction

Yoga has become an accessible and holistic practice that integrates physical, mental, and physiological components, promoting overall health and well-being. Balance and shoulder mobility are fundamental aspects of physical fitness, influencing postural stability, coordination, and movement efficiency in both daily and athletic activities. Maintaining these abilities supports functional independence and helps prevent injuries associated with limited flexibility or muscular imbalance. Considering the multidimensional nature of balance control and joint mobility, exercise programs that combine strength, flexibility, and body awareness, such as yoga, are particularly effective for young adults seeking to improve physical performance and overall health.

In this context, it has been reported that quality of life decreases as physical disability increases, while activities of daily living are negatively influenced by chronic pain [1]. Adequate joint movement, postural stability, and balance play a crucial role in ensuring the efficiency of daily tasks [2, 3]. Moreover, the prevention of acute and chronic musculoskeletal injuries, gait limitations, and the risk of falls can be addressed through improvements in balance and flexibility [4, 5]. Enhancing flexibility and range of

doi:10.15561/20755279.2025.0601

motion facilitates more efficient movement and performance of everyday activities [6].

Yoga contributes to both physical and psychological well-being by improving fitness, reducing stress, enhancing posture and sleep quality, and increasing awareness of healthy behaviors [7]. Regular practitioners are less likely to experience muscle imbalances, posture disorders, or injuries affecting the spine and shoulder regions [8]. This is supported by the findings of Arbo et al. [9], who reported that a structured yoga program reduced injury risk and perceived fatigue among soccer players.

Originating in ancient India, yoga is grounded in a philosophy that emphasizes balance and harmony across physical, mental, and emotional dimensions. It includes postures (asanas) performed for controlled periods, breathing regulation (pranayama), focused meditation, and repetitive verbal expressions [10, 11]. A growing body of evidence indicates that yoga interventions generally produce positive outcomes. For instance, a six-week yoga program resulted in reduced depression levels and increased flexibility and balance among participants [12]. Similarly, another study investigating yoga-based exercises in healthy women demonstrated improvements in flexibility, though quality of life, depression, and physical activity levels remained unchanged [13].

Analysis of previous research has shown that yoga practice enhances physical performance through improvements in flexibility, balance, and postural control, while also contributing to psychological well-being [7, 9, 12, 13]. Researchers emphasize that the benefits of yoga extend beyond general fitness, influencing neuromuscular coordination and joint mobility, which are essential for maintaining daily functionality and preventing injuries [2, 3, 4]. At the same time, the relationship between regular yoga participation and specific components of motor control, such as static and dynamic balance combined with shoulder mobility, remains of practical interest. This area continues to attract scientific attention, encouraging further examination of yoga's potential effects within university populations.

Previous studies have generally explored the effects of yoga on balance or flexibility separately. However, research that evaluates directional dynamic balance together with bilateral shoulder mobility in university students is still limited. Considering that both parameters contribute to overall physical performance and movement efficiency, their combined assessment offers a more comprehensive perspective on the functional effects of yoga practice. Therefore, this randomized controlled trial aimed to examine the influence of an eight-week yoga program on dynamic balance and shoulder mobility in university students without prior yoga experience.

Materials and Methods

Participants

This study aimed to determine the effects of yoga practice on shoulder mobility and balance. A total of 40 healthy university students aged over 18 years participated in the study. None of them had previous experience with regular yoga practice. All participants were in good health and met the inclusion criteria listed below. The detailed demographic characteristics of the training and control groups are presented in Table 1.

Table 1. Demographic characteristics of the participants

Variable	Training group	Control group
Age (years)	21.41 ± 1.68	20.10 ± 1.24
Height (cm)	164.90 ± 8.84	166.54 ± 10.04
Weight (kg)	58.81 ± 9.86	63.72 ± 12.25
BMI (kg/m²)	21.57 ± 2.82	22.95 ± 3.39
% Fat	21.24 ± 7.07	21.50 ± 8.44
Leg length (cm)	87.10 ± 5.65	88.57 ± 5.41

Inclusion criteria:

a) Age 18 years or older and current enrollment as university students.

b) Voluntary participation in the study.

c) No prior participation in yoga training and no engagement in other structured exercise programs.

Exclusion criteria:

a) Any health problem preventing safe participation in exercise within the past 30 days.

b) Intense exercise, training, or excessive physical exertion within the 24 hours preceding the test.

c) Absence from the yoga sessions or voluntary withdrawal at any stage of the study.

Participants were randomly assigned to the training and control groups using a computer-generated random number sequence to ensure allocation concealment. All 40 participants (20 per group) completed the pre- and post-intervention assessments. In the training group, 18 participants attended all eight yoga sessions (100% adherence), while two participants missed one session each (minimum attendance rate 87.5%). No dropouts occurred in either group.

Ethical approval for the study was obtained from the Non-Interventional Clinical Research Ethics Committee of Alanya Alaaddin Keykubat University (Decision No: 2024/19, Decision date: 14.05.2024). The study followed the principles of the Declaration of Helsinki, and all participants signed informed consent forms prior to testing.

The participants were divided into two groups: yoga training and control. Initially, 36 students were recruited for the training group and 35 for the control group. After applying the exclusion criteria, 40 participants remained and were randomly selected for the final sample (20 in each group).

Study Design

The study followed a randomized controlled design. Participants were randomly allocated into two groups: the yoga training group and the control group. The intervention lasted eight weeks, with yoga sessions conducted once a week for one hour. All sessions were supervised by a certified yoga instructor, and attendance was recorded to monitor adherence.

The pre- and post-tests included measurements of height, weight, BMI, body fat percentage, and leg length, as well as assessments of shoulder mobility and static and dynamic balance. The experimental procedure is illustrated in Figure 1, which presents the overall study flow.

Procedure

All measurements and yoga sessions were conducted in the multi-purpose hall of the Alanya Youth Center. During the pre- and post-test sessions, participants wore comfortable sportswear and their own running shoes. Each testing session began with a standard warm-up that included dynamic exercises. Following the warm-up, height, weight, BMI, and body fat percentage were measured, after which shoulder mobility and static and dynamic balance tests were administered.

The yoga intervention for the training group consisted of one-hour sessions held once a week for eight consecutive weeks. All sessions were supervised by a certified yoga instructor with seven years of professional experience. After completing the eight-week program, the same assessments were repeated to evaluate post-intervention changes.

Yoga Practice

During the initial weeks, yoga sessions focused on correct breathing, posture, and alignment, gradually evolving into routine flow sequences. Each class began with a 3–4-minute breath-oriented guided meditation designed to help participants disengage from daily stress and become fully present on the mat. The sessions opened with a traditional mantra, followed by warm-up movements synchronized with breathing to prepare the body and joints for practice. These included gentle exercises targeting the neck, shoulders, knees, legs, wrists, and ankles, as well as energy-activating movements.

The warm-up phase was followed by the *Surya Namaskar* (Sun Salutation) series. Subsequently, participants performed various *asana* practices selected according to the focus of each session, interspersed with restorative postures and breathing pauses. The *asanas* – the physical positions of yoga – were synchronized with the breath whenever possible. Modifications and preparatory *asanas* were introduced progressively, depending on individual improvement, ensuring gradual and safe advancement.

Toward the end of each session, participants performed relaxation and deep rest in *Shavasana*, which lasted at least 10 minutes and included guided breathing and relaxation instructions. The session concluded calmly with the "Infinite Sun" song, followed by a closing mantra and salute, completing a total duration of approximately 60 minutes.

The weekly progression and detailed structure of the standardized Hatha Yoga protocol used in this intervention are presented in Table 2.

As shown in Table 2, the Hatha Yoga protocol followed a progressive structure emphasizing gradual development of posture control, balance, mobility, and relaxation. Each session maintained

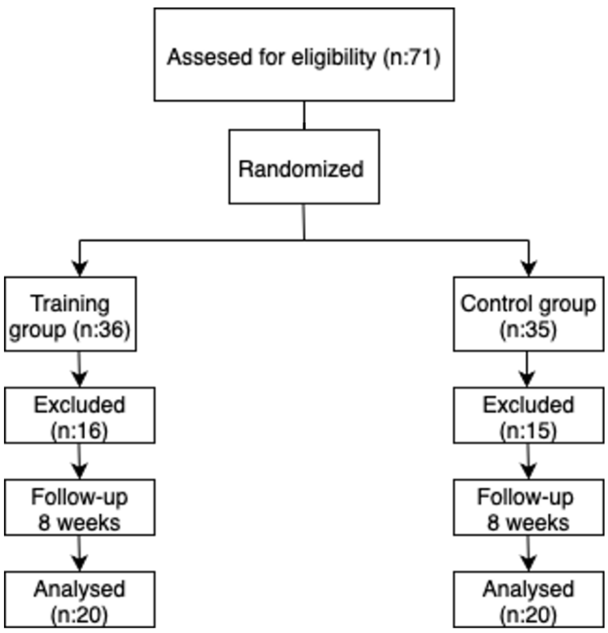

Figure 1. Study Flow Diagram

a consistent one-hour format, with minor adjustments in breathing and warm-up durations to reflect participants' adaptation over time. This standardized approach ensured both safety and continuity throughout the intervention.

Measurement and Testing

Height: Height was measured with participants standing barefoot, keeping the head in an upright position aligned with the Frankfort plane. A stadiometer (Seca, Germany) was used, with the measuring plate placed on the crown of the head. After a deep inhalation, the distance between the vertex and the soles was recorded in centimeters.

Body Weight: Body weight was measured using a Tanita BC-532 electronic scale while participants wore standard sports clothing (T-shirt and shorts). Measurements were recorded in kilograms, with a margin of error of ±0.1 kg.

Body Mass Index (BMI): BMI was calculated as body weight in kilograms divided by the square of height in meters (kg/m²).

Body Fat Percentage: Body fat percentage was assessed using a Tanita BC-532 body composition analyzer, following the manufacturer's guidelines.

Leg Length: Leg length was determined by measuring the distance between the most prominent point of the anterior superior iliac spine and the lateral malleolus of the ankle using a flexible tape measure. Participants were instructed to stand upright during measurement.

Static Balance Measurement. The validity and reliability of the Balance Error Scoring System (BESS) were established by Riemann and Guskiewicz [14]. The Turkish adaptation of this test, referred to as the Balance Error Scoring System (DHPS), was used in this study. The test evaluates postural stability by quantifying balance errors under six different stance conditions, consisting of three stance positions performed on two types of surfaces: a firm floor and a foam surface.

Each stance was maintained for 20 seconds with eyes closed. The test positions included double-leg stance, single-leg stance, and tandem stance. For the foam surface, a 50 × 41 × 6 cm medium-density foam pad (Airex Balance Pad, Alcan Airex AG, CH-5643 Sins, Switzerland) was used. The DHPS protocol was administered in the following sequence:

1. Double-leg stance on firm surface
2. Single-leg stance on firm surface
3. Tandem stance on firm surface
4. Double-leg stance on foam surface
5. Single-leg stance on foam surface
6. Tandem stance on foam surface.

During each 20-second trial, every balance error (such as lifting hands off hips, opening eyes, stepping, stumbling, or losing balance) was recorded as one point. Total error scores from all trials represented the participant's overall balance error score [15].

Dynamic Balance Measurement. Dynamic balance was assessed using the Y Balance Test, a modified version of the Star Excursion Balance Test. This test evaluates postural control and functional symmetry during single-leg stance. Participants were instructed to maintain one leg on the central platform while reaching as far as possible in three directions – anterior (AT), posteromedial (PM), and posterolateral (PL) – with the opposite leg, along lines marked in a Y-shaped pattern on the floor. The reach distance in each direction was measured in centimeters.

The angles between the reaching directions were standardized: 45° between the posteromedial and posterolateral directions, and 135° between each of them and the anterior direction. Prior

Table 2. 8-Week Standardized Hatha Yoga Protocol

Week	Session Focus	Duration Structure
Week 1	Posture awareness and breathing control	Breath preparation 5 min / Warm-up 10 min / Asana 35 min / Shavasana 10 min
Week 2	Fundamental lower-body engagement	Breath 4 min / Warm-up 8 min / Surya Namaskar + Asana 38 min / Shavasana 10 min
Week 3	Posterior chain activation and trunk stability	Breath 4 min / Warm-up 8 min / Asana 38 min / Shavasana 10 min
Week 4	Shoulder–scapular control and thoracic expansion	Breath 4 min / Warm-up 8 min / Asana 38 min / Shavasana 10 min
Week 5	Progressive unilateral balance integration	Breath 3 min / Warm-up 7 min / Asana 40 min / Shavasana 10 min
Week 6	Combined control and mobility development	Breath 3 min / Warm-up 7 min / Asana 40 min / Shavasana 10 min
Week 7	Flow continuity and endurance	Breath 3 min / Warm-up 7 min / Asana 40 min / Shavasana 10 min
Week 8	Consolidation and integration	Breath 3 min / Warm-up 7 min / Asana 40 min / Shavasana 10 min

to data collection, participants performed three familiarization trials. A 120-second rest interval was provided between trials to prevent fatigue.

The testing sequence was as follows:

1. Anterior reach with left leg standing, right leg reaching
2. Anterior reach with right leg standing, left leg reaching
3. Posteromedial reach with left leg standing, right leg reaching
4. Posteromedial reach with right leg standing, left leg reaching
5. Posterolateral reach with left leg standing, right leg reaching
6. Posterolateral reach with right leg standing, left leg reaching.

Each participant performed three valid trials in each direction, and the best reach distance was recorded. A trial was considered invalid if the participant lost balance, lifted the stance foot, touched the floor beyond the reach line, or failed to return the reaching foot to the starting position.

The normalized balance score for each direction was calculated using the formula [16]:

$$(Reach\ Distance\ /\ Leg\ Length) \times 100$$

The composite balance score, representing overall dynamic balance performance, was computed as [17, 18]:

$$[(AT + PM + PL) / (Leg\ Length \times 3)] \times 100$$

Shoulder Mobility Measurement. Shoulder mobility was evaluated to assess bilateral and reciprocal shoulder range of motion through the combined movements of internal rotation and adduction on one side, and external rotation and abduction on the other. The test was performed following the Functional Movement Screen (FMS) shoulder mobility protocol.

Before testing, the hand length was determined by measuring the distance in inches between the distal wrist crease and the tip of the third finger. Participants were then instructed to make fists with both hands, placing the thumbs inside the fists. One arm was positioned in maximal adduction, extension, and internal rotation, while the opposite arm was placed in maximal abduction, flexion, and external rotation. With both hands in fists, participants reached behind the back simultaneously, attempting to bring the hands as close together as possible in a smooth and controlled motion.

The distance between the nearest bony prominences of the fists was measured in centimeters using a standard measuring tape or ruler [19]. Measurements were taken separately for the right (SM_right) and left (SM_left) sides.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics version 24. Descriptive statistics, including means, standard deviations, and frequency distributions, were calculated for all variables. The normality of the data was assessed using the Skewness-Kurtosis test.

For between-group comparisons of normally distributed variables, the Independent Samples t-test was applied, while the Mann-Whitney U test was used for non-normally distributed variables. For within-group (pre–post) comparisons, the Paired Samples t-test was used for normally distributed data, and the Wilcoxon signed-rank test was applied for non-normally distributed data. The level of statistical significance was set at $p < 0.05$.

Results

The comparison of pre- and post-test results between the training and control groups is presented in Table 3. The table summarizes the mean ± standard deviation (SD) values and p-values for each measured variable. Significant improvements were observed in several balance parameters after the eight-week yoga intervention.

When Table 3 was examined, no significant differences were observed between the training and control groups in the pre-test results ($p > 0.05$). However, significant differences were found in the right posterolateral, right composite, left anterior, left posterolateral, and left composite scores in the post-test ($p < 0.05$). No significant differences were observed in other variables ($p > 0.05$).

The comparison of pre- and post-test results within the training and control groups is presented in Table 4. The table shows the mean ± standard deviation (SD) values and p-values for each measurement variable, allowing assessment of changes that occurred after the eight-week yoga intervention in each group separately.

When Table 4 was examined, statistically significant improvements were found in the right posterolateral, right composite, left anterior, left

Table 3. Comparison Between Groups

Variable	Group	Pre		Post	
		Mean ± SD	p	Mean ± SD	p
BESS	Training	18.45 ± 4.95	0.253	15.95 ± 5.86	0.603
	Control	20.70 ± 7.10		16.95 ± 6.18	
RIGHT_ANT	Training	76.35 ± 6.01	0.796	77.75 ± 5.57	0.097
	Control	75.85 ± 5.95		75.00 ± 4.57	

Table 3. (Continued)

Variable	Group	Pre		Post	
		Mean ± SD	p	Mean ± SD	p
RIGHT_PM	Training	113.85 ± 8.89	0.457	113.85 ± 8.89	0.417
	Control	111.75 ± 5.75		111.75 ± 5.75	
RIGHT_PL	Training	109.47 ± 10.12	0.305	115.58 ± 10.11	**0.006**
	Control	106.64 ± 6.76		108.02 ± 5.77	
RIGHT_COM	Training	115.27 ± 12.26	0.252	121.43 ± 11.10	**0.002**
	Control	111.22 ± 9.60		111.02 ± 8.55	
LEFT_ANT	Training	76.91 ± 7.45	0.797	76.91 ± 7.45	**0.024**
	Control	75.67 ± 5.47		75.67 ± 5.57	
LEFT_PM	Training	113.63 ± 12.42	0.570	113.63 ± 12.42	0.664
	Control	110.38 ± 5.84		110.38 ± 5.84	
LEFT_PL	Training	110.36 ± 11.82	0.168	110.36 ± 11.82	**0.042**
	Control	106.44 ± 6.15		106.06 ± 6.15	
LEFT_COM	Training	113.31 ± 10.08	0.378	120.46 ± 11.21	**0.007**
	Control	110.72 ± 8.12		110.97 ± 9.77	
SM_RIGHT	Training	5.17 ± 5.66	0.683	4.05 ± 5.13	0.079
	Control	5.85 ± 4.64		6.65 ± 3.88	
SM_LEFT	Training	8.47 ± 6.91	0.837	6.50 ± 5.69	0.168
	Control	8.05 ± 6.00		9.57 ± 7.96	

Note: BESS = Balance Error Scoring System; ANT = Anterior; PM = Posteromedial; PL = Posterolateral; COM = Composite; SM = Shoulder Mobility. $p < 0.05$ was considered statistically significant.

Table 4. Within-Group Comparison

Variable	Test	Training Group		Control Group	
		Mean ± SD	p	Mean ± SD	p
BESS	Pre	18.45 ± 4.95	**0.021**	20.70 ± 7.10	0.063
	Post	15.95 ± 5.86		16.95 ± 6.18	
RIGHT_ANT	Pre	76.35 ± 6.01	0.189	75.85 ± 5.95	0.532
	Post	77.75 ± 5.57		75.00 ± 4.57	
RIGHT_PM	Pre	113.85 ± 8.89	0.370	111.75 ± 5.75	0.550
	Post	115.66 ± 7.36		113.44 ± 7.36	
RIGHT_PL	Pre	109.47 ± 10.12	**0.004**	106.64 ± 6.76	0.448
	Post	115.58 ± 10.11		108.02 ± 5.77	
RIGHT_COM	Pre	115.27 ± 12.26	**0.008**	111.22 ± 9.60	0.935
	Post	121.43 ± 11.10		111.02 ± 8.55	
LEFT_ANT	Pre	76.91 ± 7.45	0.179	75.67 ± 5.47	0.823
	Post	78.33 ± 5.46		75.26 ± 4.03	
LEFT_PM	Pre	113.63 ± 12.42	0.411	110.38 ± 5.84	0.079
	Post	114.40 ± 10.98		114.00 ± 6.56	
LEFT_PL	Pre	110.36 ± 11.82	**0.023**	106.44 ± 6.15	0.514
	Post	113.98 ± 12.80		106.85 ± 7.26	
LEFT_COM	Pre	113.31 ± 10.08	0.061	110.72 ± 8.12	0.915
	Post	120.46 ± 11.21		110.97 ± 9.77	
SM_RIGHT	Pre	5.17 ± 5.66	0.117	5.85 ± 4.64	0.485
	Post	4.05 ± 5.13		6.65 ± 3.88	

Table 4. (Continued)

Variable	Test	Training Group		Control Group	
		Mean ± SD	p	Mean ± SD	p
SM_LEFT	Pre	8.47 ± 6.91	**0.019**	8.05 ± 6.00	0.282
	Post	6.50 ± 5.69		9.57 ± 7.96	

Note: BESS = Balance Error Scoring System; ANT = Anterior; PM = Posteromedial; PL = Posterolateral; COM = Composite; SM = Shoulder Mobility. $p < 0.05$ was considered statistically significant.

posterolateral, and left composite scores between the pre- and post-tests of the training group ($p < 0.05$). No significant differences were observed in the control group ($p > 0.05$).

Discussion

The aim of this study was to examine the effects of an eight-week yoga program on balance and shoulder mobility in university students. The findings demonstrated no significant differences between the training and control groups in the pre-test for any variable. However, post-test results revealed significant improvements in several components of the Y-balance test, specifically in the right posterolateral, right composite, left anterior, left posterolateral, and left composite scores ($p < 0.005$). These findings indicate that yoga practice contributed positively to dynamic balance performance among participants in the training group compared with the control group.

The improvement in dynamic balance observed in this study aligns with previous research demonstrating the beneficial effects of yoga on postural control and neuromuscular coordination. In a study investigating the impact of yoga and physiotherapy on individuals with chronic low back pain, yoga practice led to significant enhancements in balance and overall well-being [20]. Similarly, research involving individuals with schizophrenia showed that yoga improved dynamic balance and physical health, thereby supporting better quality of life outcomes [21]. Mondal et al. [22] also suggested that yoga practices may improve static balance, thereby contributing to greater overall stability across various physical activities and environments.

The present study's results are consistent with earlier findings reporting improvements in flexibility and balance following yoga interventions. In a ten-week study conducted among university athletes, yoga training resulted in significant gains in flexibility and static balance, though no marked changes were observed in shoulder mobility [23]. In contrast, our study demonstrated that yoga practice enhanced not only static and dynamic balance but also shoulder mobility, indicating that regular yoga participation can support multiple aspects of physical functionality.

These findings are further supported by evidence from other experimental studies. Hatha yoga training has been shown to improve static balance in healthy young adults [24], while Silver and Mokha [25] observed significant gains in dynamic balance following six weeks of yoga practice. Similarly, Csala et al. [26] reported improved static balance after ten weeks of yoga training, and another study on young adults found significant improvements in static balance within just six weeks of incorporating yoga into their regular routines [27]. Collectively, these results emphasize the role of yoga as an effective modality for developing postural stability and balance control.

The improvements in flexibility and mobility observed in our study are in line with prior findings demonstrating yoga's contribution to musculoskeletal adaptability. Polsgrove et al. [23] reported that participants who practiced yoga for ten weeks improved flexibility, mobility, and balance performance, whereas no significant changes occurred among non-practicing controls. Similarly, yoga has been shown to enhance joint range of motion in specific body regions [28]. In a study examining the influence of yoga on physical and respiratory function among healthy, inactive middle-aged adults, those performing asanas demonstrated improved shoulder mobility after eight weeks of training [29]. Farinatti et al. [30] likewise observed a significant increase in shoulder flexibility following yoga practice.

Taken together, the present findings suggest that regular yoga training can enhance both balance and shoulder mobility by combining postural control, flexibility, and mindful movement. These results confirm the functional relevance of yoga as an integrative exercise approach for improving neuromuscular coordination and joint mobility in university students.

The findings of this study confirm that regular yoga practice contributes to measurable improvements in dynamic balance and shoulder mobility among university students. The observed changes are consistent with earlier studies demonstrating the positive influence of yoga on postural control, neuromuscular coordination, and flexibility across different populations. These results highlight the multidimensional nature of yoga, which integrates balance, strength, and flexibility through controlled movement and breath synchronization. Taken together, the evidence supports the interpretation that yoga can serve as an effective means of enhancing functional movement and physical performance in young adults engaged in academic life.

Limitations of the Study

This study has several limitations that should be acknowledged. The sample size was relatively small and limited to university students, which may restrict the generalizability of the findings to other age groups or populations. The intervention lasted only eight weeks and included one session per week, which may not fully reflect the long-term effects of yoga practice. Additionally, the study relied on physical performance measures without incorporating physiological or psychological assessments that could provide a more comprehensive understanding of the observed improvements. Future studies with larger and more diverse samples, extended intervention periods, and multidimensional evaluation methods are recommended to build on these findings.

Conclusions

The study highlights the relevance of yoga as an integrative physical activity that combines postural control, flexibility, and body awareness. Regular participation in structured yoga programs can be considered a feasible approach to supporting physical health, functional movement, and overall well-being in university populations. The findings also emphasize the importance of incorporating yoga-based practices into educational and recreational settings to foster healthy, balanced, and sustainable lifestyles among young adults.

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this study.

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Cite this article as:
Odemis M, Denami S, Cobanoglu HO, Yalcin O, Kacoglu C. Effects of yoga on balance and shoulder mobility in university students: a randomized controlled trial. *Physical Education of Students,* 2025;29(6):437–445. https://doi.org/10.15561/20755279.2025.0601

Received: 12.10.2025

Accepted: 15.11.2025; Published: 30.12.2025