Journal of International Islamic Law, Human Rights, and Public Policy
(JISHUP Journal) | ISSN(e): 3031-2280
Website https://jishup.org/index.php/ojs/index | Volume 4 No. 2 (2026)

Effect of Suryanamaskar Practice on Selected Physical Fitness Variables Among Male District-Level Volleyball Players of Kashmir

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Received: 15/05/2026 | **Revised:** 20/05/2026 | **Accepted:** 11/06/2026 | **Published:** 29/06/2026

Abstract

The purpose of the present study was to examine the effect of Suryanamaskar practice on selected physical fitness variables among male district-level (Bandipora) volleyball players of Kashmir. Fifteen male volleyball players aged between 15 and 20 years were selected through simple random sampling. The study employed a single-group pre-test and post-test research design. The selected participants underwent a structured Suryanamaskar training programme for six weeks, five days per week, with each session lasting 30–45 minutes. The dependent variables selected for the study were speed, agility, and flexibility. Speed was measured using the 50-Meter Dash Test, agility through the Shuttle Run Test, and flexibility through the Sit-and-Reach Test. Descriptive statistics, including mean and standard deviation, were computed, while a dependent-samples t-test was used to determine the significance of differences between pre-test and post-test scores at the 0.05 level of significance. The results revealed a significant improvement in agility ($t = 3.25$, $p < 0.05$) and flexibility ($t = 7.95$, $p < 0.05$) following the Suryanamaskar intervention. However, the improvement in speed was not statistically significant ($t = 0.46$, $p > 0.05$). The findings indicate that regular Suryanamaskar practice effectively enhances agility and flexibility among volleyball players but has limited influence on speed performance. Therefore, Suryanamaskar may be incorporated as a supplementary training modality in volleyball conditioning programmes to improve selected components of physical fitness. The study concludes that traditional yogic practices can serve as cost-effective and scientifically supported methods for enhancing athletic performance and physical fitness.

Keywords: Suryanamaskar, Volleyball Players, Physical Fitness, Agility, Flexibility, Speed, Yoga Training, Athletic Performance, Sports Conditioning, Kashmir

Introduction

Volleyball is a dynamic and highly competitive sport that requires players to possess a combination of speed, agility, flexibility, strength, endurance, and technical proficiency to perform effectively during training and competition. Success in volleyball largely depends on the player's ability to execute rapid movements, change directions efficiently, and maintain optimal physical fitness throughout the game (Sahaya, 2009). As sports performance has become increasingly dependent on scientific training methods, coaches and sports scientists continually seek effective training interventions to enhance athletes' physical fitness and overall performance (Matveyev, 1981). Physical fitness is recognized as a fundamental component of athletic excellence and overall health. It encompasses several attributes, including speed, agility, flexibility, muscular strength, and endurance, which enable individuals to perform daily and sport-specific activities efficiently without undue fatigue (Clarke, 1992). In volleyball, these physical fitness components play a crucial role in executing essential skills such as serving, spiking, blocking, and defensive movements. Therefore, improving physical fitness remains a primary objective in volleyball training programmes. Yoga has gained considerable attention as a complementary training method due to its positive effects on physical, physiological, and psychological well-being. Among various yogic practices, Suryanamaskar (Sun Salutation) is one of the most widely practiced dynamic sequences that integrates physical postures, breathing

techniques, and mindfulness (Saraswati, 1996). Originating from ancient Indian traditions, Suryanamaskar consists of twelve sequential postures performed rhythmically with synchronized breathing, promoting holistic development of the body and mind (Choudhury, 2008). Previous research has demonstrated that regular practice of Suryanamaskar can improve flexibility, muscular strength, balance, cardiovascular efficiency, and overall physical fitness (Telles et al., 2013). Studies have also reported significant improvements in flexibility, explosive power, body composition, and other fitness-related variables among athletes and students following structured Suryanamaskar interventions (Elumalai & Pajanivel, 2020; Verma et al., 2022; Srivastav & Kar, 2024). Furthermore, the practice has been recognized as an effective and economical training modality requiring minimal equipment while offering substantial physical and psychological benefits (Das, 2023).

Despite the growing body of evidence supporting the effectiveness of Suryanamaskar, limited research has specifically examined its impact on the physical fitness characteristics of volleyball players, particularly at the district level. Volleyball players require a high degree of speed, agility, and flexibility to meet the demands of the sport, yet the potential contribution of yogic training methods to these fitness components remains underexplored. Therefore, investigating the effectiveness of Suryanamaskar practice among volleyball players may provide valuable insights for coaches, athletes, and sports practitioners seeking alternative and holistic training approaches. Hence, the present study was undertaken to examine the effect of Suryanamaskar practice on selected physical fitness variables, namely speed, agility, and flexibility, among male district-level volleyball players of Kashmir. The findings of this study may contribute to the development of scientifically supported training programmes that integrate traditional yogic practices with modern sports conditioning strategies.

Methodology

Source of Data

Male district-level (Bandipora) volleyball players from Kashmir provided the data for this study. These athletes were actively taking part in district-level volleyball practices and tournaments.

Selection of Subjects

A total of 15 male district-level (Bandipora) volleyball players were selected as subjects for this study. The subjects' ages ranged from 15 to 20 years. All subjects were physically fit and regularly involved in volleyball training and activities.

Sampling Technique and Research Design

The subjects for the study were selected using simple random sampling. Each player had an equal chance of being selected for participation in the research. This method helped to minimize bias and ensured fairness in the selection process.

Selection of Variables

Independent Variable: Suryanamaskar Practice
Dependent Variables: Speed, Agility, and Flexibility

Criterion Measure

To measure the selected physical fitness variables, standardized tests were used. The following tests were selected:

- 50 Meter Dash Test – to measure speed
- Shuttle Run Test – to measure agility
- Sit and Reach Test – to measure flexibility

Training Program

The selected subjects underwent a Suryanamaskar training programme for a specific duration. The training programme was conducted for 6 weeks, with five sessions per week. Each session lasted approximately 30–45 minutes.

The training session included:

- Warm-up (5–10 minutes)
- Light jogging
- Stretching exercises
- Main Activity (20–25 minutes)
- Practice of Surya Namaskar (12 postures)
- Initially, 6 rounds were performed and gradually increased to 12 rounds depending on the subjects' capacity.

- Cool Down (5–10 minutes)
- Light stretching
- Relaxation exercises

The subjects were instructed to perform the Surya Namaskar sequence correctly with proper breathing techniques.

Collection of Data

The data for the selected variables were collected twice:

- Pre-Test: Before the beginning of the Suryanamaskar training programme.
- Post-Test: After the completion of the eight-week training programme.
- The performance of each subject in speed, agility, and flexibility was recorded carefully during both tests.
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Statistical Techniques

To analyse the collected data, descriptive statistics such as Mean, Standard Deviation, Skewness, and Kurtosis were calculated to characterize the data. To determine the significant difference in the effect of Suryanamaskar practice on selected physical fitness variables among male district-level volleyball players, a dependent-samples t-test was employed. To test the hypothesis, the significance level was set at 0.05.

Analysis of Data and Results

Table 1: Descriptive statistics of Agility

Test	N	Min	Max	Mean	SD	Skewness	Kurtosis
Pre-Test	15	10.48	12.82	11.33	0.70	0.38	-0.62
Post-Test	15	10.07	12.56	11.07	0.74	0.21	-0.55

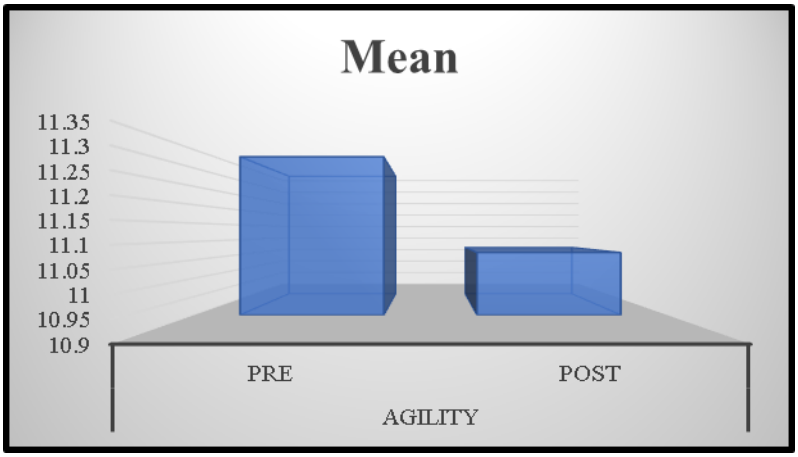

Fig 1: Mean comparison of Agility

The descriptive statistics for agility showed that the mean pre-test agility score was 11.33 seconds (SD = 0.70), which improved to 11.07 seconds (SD = 0.74) in the post-test, indicating a slight improvement in agility performance after the intervention. The pre-test scores ranged from 10.48 to 12.82 seconds, while the post-test scores ranged from 10.07 to 12.56 seconds, suggesting a marginal reduction in performance time. The skewness values for both the pre-test (0.38) and post-test (0.21) were within the acceptable range, indicating that the data were approximately normally distributed with slight positive skewness. Similarly, the kurtosis values for pre-test (-0.62) and post-test (-0.55) indicated platykurtic distributions, indicating that the scores were moderately flatter than the normal distribution. Overall, the descriptive analysis suggests a modest improvement in agility performance from pre-test to post-test, with the data demonstrating near-normal distribution characteristics.

Table 2: Descriptive statistics of Flexibility

Test	N	Min	Max	Mean	SD	Skewness	Kurtosis
Pre-Test	15	20	41	31.00	5.85	-0.32	-0.68
Post-Test	15	24	46	34.00	5.60	-0.28	-0.59

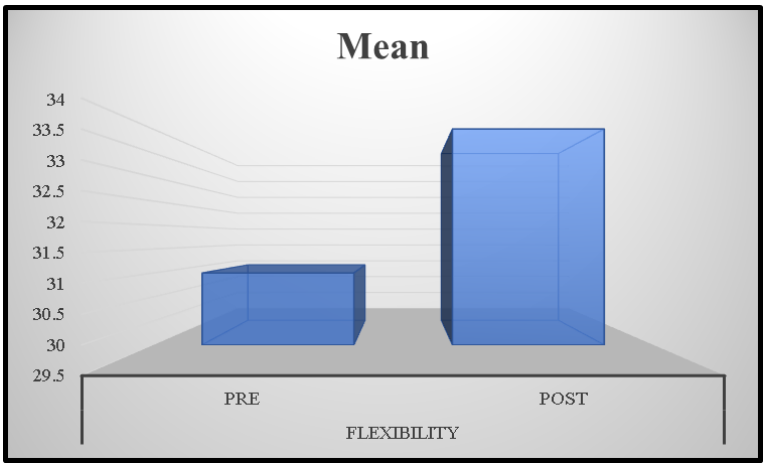

Fig 2: Mean comparison of Flexibility

The descriptive statistics for flexibility revealed that the mean pre-test flexibility score was 31.00 (SD = 5.85), which increased to 34.00 (SD = 5.60) on the post-test, indicating an improvement in flexibility performance following the intervention. The pre-test scores ranged from 20 to 41, whereas the post-test scores ranged from 24 to 46, indicating an increase in participants' flexibility. The skewness values for the pre-test (-0.32) and post-test (-0.28) were within the acceptable range, suggesting that the data were approximately normally distributed with a slight negative skew. Likewise, the kurtosis values for the pre-test (-0.68) and post-test (-0.59) indicated platykurtic distributions, meaning the scores were slightly flatter than a normal distribution. Overall, the descriptive analysis indicates an improvement in flexibility performance from pre-test to post-test, while the distribution of scores remained reasonably normal and suitable for further statistical analysis.

Table 3: Descriptive statistics of Speed

Test	N	Min	Max	Mean	SD	Skewness	Kurtosis
Pre-Test	15	6.82	10.03	7.92	0.86	1.12	1.48
Post-Test	15	6.75	9.67	7.87	0.69	0.78	0.92

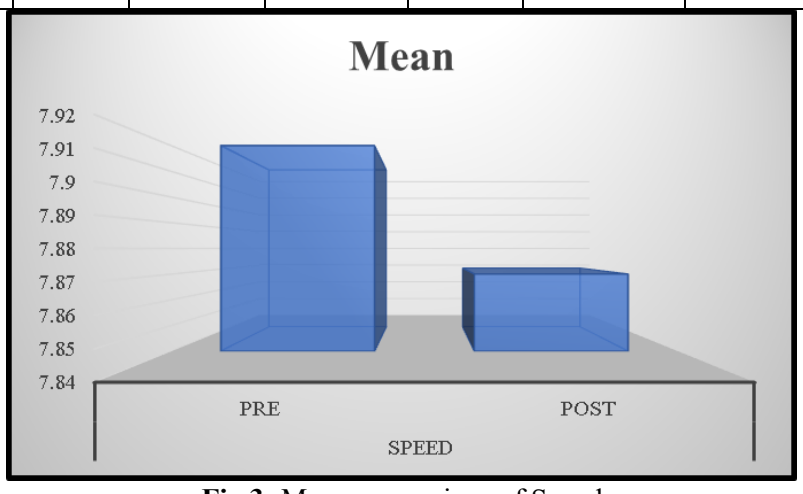

Fig 3: Mean comparison of Speed

The descriptive statistics for speed indicated that the mean pre-test score was 7.92 seconds (SD = 0.86), which slightly improved to 7.87 seconds (SD = 0.69) in the post-test, suggesting a marginal improvement in speed performance following the intervention. The pre-test scores ranged from 6.82 to 10.03 seconds, while the post-test scores ranged from 6.75 to 9.67 seconds, showing a slight reduction in sprint time. The skewness values for the pre-test (1.12) and post-test (0.78) indicate a positive skew, though within an acceptable range for normality. Similarly, the kurtosis values for the pre-test (1.48) and post-test (0.92) indicate a leptokurtic distribution, meaning that the scores were somewhat more peaked than a normal distribution. Overall, the descriptive analysis indicates a slight improvement in speed performance from pre-test to post-test, and the data exhibit acceptable distributional characteristics for further statistical analysis.

Table 3: Inferential statistics of Agility, Flexibility and Speed

Variable	Phase	Mean	MD	SD	Std Error	Sig. P Value	t- Ratio
Agility	Pre	11.33	0.26	0.31	0.08	0.00	3.25
	Post	11.07					
Flexibility	Pre	31	3.00	1.46	0.38	0.00	7.95
	Post	34					
Speed	Pre	7.92	0.05	0.42	0.11	0.00	0.46
	Post	7.87					

The inferential analysis of agility, flexibility, and speed revealed mixed effects of the intervention on the selected physical fitness variables. In agility, the mean score improved from 11.33 on the pre-test to 11.07 on the post-test, with a mean difference of 0.26, a standard deviation of 0.31, and a calculated standard error of 0.08. The obtained *t*-ratio of 3.25 indicated a statistically significant improvement in agility performance at the 0.05 level. Similarly, flexibility showed a marked improvement, with the mean increasing from 31.00 in the pre-test to 34.00 in the post-test, yielding a mean difference of 3.00, a standard deviation of 1.46, and a standard error of 0.38. The *t*-ratio of 7.95 demonstrated a highly significant improvement in flexibility after the intervention. In contrast, speed improved only marginally, with the mean decreasing from 7.92 to 7.87, yielding a mean difference of 0.05, a standard deviation of 0.42, and a standard error of 0.11. The obtained *t*-ratio of 0.46 was not statistically significant, indicating that the intervention did not bring about a meaningful improvement in speed performance. Therefore, it can be concluded that the intervention was effective in significantly enhancing agility and flexibility, whereas no significant effect was observed on speed.

Discussion

The findings of the present study strongly support previous research. Verma et al. (2022) reported significant improvements in flexibility among healthy children after six weeks of Suryanamaskar training. Similarly, Dubey and Choudhary (2024) found enhanced back flexibility and lumbar flexion among female college students following a structured Suryanamaskar program. Pal et al. (2024) also observed significant gains in flexibility among yoga practitioners. Therefore, the present findings further confirm that Suryanamaskar is an effective means of improving flexibility among athletes and sportspersons. Although the mean speed score improved slightly from 7.92 seconds in the pre-test to 7.87 seconds in the post-test, the improvement was not statistically significant ($t = 0.46$, $p > 0.05$). Therefore, the hypothesis that Suryanamaskar has a significant effect on speed was not supported. The lack of significant improvement in speed may be attributed to several factors. First, speed development generally requires specific sprint training, explosive-power exercises, plyometric drills, and neuromuscular adaptations directly related to rapid movement performance. While Suryanamaskar improves flexibility, coordination, muscular endurance, and general fitness, it may not provide sufficient stimulus to produce substantial improvements in sprinting speed within a relatively short intervention period. Secondly, the six-week duration and the limited sample size of 15 participants may not have been sufficient to produce measurable changes in speed performance. The improvement observed in speed, although positive, was too small to reach statistical significance. These findings suggest that while Suryanamaskar is beneficial for enhancing overall physical fitness, it should be combined with sport-specific speed training when the primary objective is to improve sprint performance in volleyball players. The overall findings of the study indicate that Suryanamaskar is an effective training modality for improving selected components of physical

fitness, particularly flexibility and agility, among volleyball players. The practice integrates dynamic stretching, muscular engagement, balance, breathing regulation, and coordinated body movements, which collectively enhance physical performance. Volleyball players require high levels of flexibility and agility for effective movement, quick directional changes, jumping, blocking, and defensive actions. The significant improvements observed in these variables suggest that Suryanamaskar can be incorporated as a supplementary training method in volleyball conditioning programs. However, to enhance speed, coaches should integrate additional speed-specific exercises alongside Suryanamaskar practice. The findings of the present investigation support the growing body of literature emphasizing the importance of yoga-based training methods in sports performance enhancement. The study demonstrates that traditional yogic practices can serve as cost-effective, equipment-free, and scientifically supported approaches for improving important physical fitness components among athletes.

Conclusion

The analysis and interpretation of the collected data yielded several key conclusions regarding the impact of Suryanamaskar on select physical fitness parameters among male district-level volleyball players. Specifically, the practice of Suryanamaskar led to a significant enhancement in agility. This improvement can be attributed to the dynamic transitions inherent in the various postures, which enhance body control, balance, and coordination, all critical components for agility performance in volleyball. Furthermore, results indicated a highly significant enhancement in flexibility due to regular practice. The systematic stretching of major muscle groups and joints across the twelve postures markedly increased participants' range of motion and overall flexibility. However, Suryanamaskar did not yield a statistically significant improvement in speed performance, although a minor improvement was observed. When evaluating the selected physical fitness variables, flexibility emerged as the area of greatest enhancement, closely followed by agility. These findings affirm that Suryanamaskar is an effective yogic intervention for developing key physical fitness attributes essential for volleyball performance, specifically flexibility and agility. Moreover, given its cost-effectiveness, lack of requirement for specialized equipment, and robust scientific backing, Suryanamaskar can be seamlessly integrated into regular volleyball conditioning programs. This practice may thus be regarded as a valuable supplementary training strategy to bolster overall physical fitness and movement efficiency among volleyball athletes. The study corroborates prior research suggesting that yogic practices can positively influence physical fitness and athletic performance.

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