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Effect of Selected Yogasanas on the Motor Fitness of Elementary School Students

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Abstract

This investigation examined whether a structured programme of selected yogasanas could improve motor fitness among elementary school girls. Thirty students from Tamralipta Public School, Purba Medinipur, West Bengal, aged 12 to 15 years, were selected randomly and assigned to an experimental group (n = 15) and a control group (n = 15). The intervention lasted six weeks. The experimental group practised yoga twice daily for 45 minutes per session, excluding Sundays and holidays, while the control group continued its usual routine. The programme included Surya Namaskar, Paschimottanasana, Matsyasana, Halasana, Ushtrasana, Sarvangasana, and pranayama practices such as Anuloma-Viloma, Bhastrika, and Ujjayi. Motor fitness was assessed through a bridge-up test for flexibility, a 6 x 10 m shuttle run for agility, and the Harvard step test for cardiorespiratory endurance. Statistical comparison of pre-test and post-test scores at the 0.05 level showed significant gains in agility and cardiovascular endurance for the experimental group, whereas the improvement in flexibility was small and not statistically significant. The control group did not show meaningful change in any variable. The study indicates that a short-term yoga programme can enhance selected components of motor fitness in school-aged girls, although a longer intervention may be required to improve flexibility substantially.

Keywords: *yogasana; yoga in schools; motor fitness; agility; flexibility; cardiorespiratory endurance.*

Introduction

Yoga has traditionally been understood as a disciplined system that brings together physical posture, breath control, concentration, and self-regulation. In school physical education, however, yoga may also be viewed in very practical terms: it is a structured movement programme that can be delivered with limited space, minimal equipment, and considerable flexibility in difficulty level. Because of these characteristics, yoga has become increasingly relevant to educational settings that seek accessible ways to develop physical fitness along with mental steadiness and body awareness.

Classical descriptions of yoga, particularly those associated with Patanjali, place asana and pranayama within a broader framework of personal discipline and mental control. Contemporary practice in schools usually focuses on these physical and breathing components. Even when used in a simplified form, yogic exercises may influence posture, coordination, balance, controlled movement, muscular readiness, and recovery. For that reason, yoga is often discussed not only as a wellness practice but also as a potential aid to performance-related variables in physical education. Motor fitness is especially important during the school years. A child who develops adequate agility, flexibility, and cardiorespiratory endurance is usually better prepared for games, classroom activities, recreational sport, and everyday movement tasks. These capacities also provide a foundation for later athletic development. If yogasana practice can strengthen such qualities, it may offer schools a practical and economical supplement to conventional conditioning drills.

The possible contribution of yoga to motor fitness should be examined in specific rather than general terms. Not all physical qualities respond in the same manner or at the same rate. Flexibility may require sustained stretching over a longer period, while agility and endurance may respond earlier to improved movement control, breathing rhythm, and regular activity. A focused study is therefore needed to identify which motor fitness variables show measurable change after a brief school-based yoga intervention.

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The present investigation was designed to assess the effect of selected yogasanas on three important motor fitness components among elementary school girls: flexibility, agility, and cardiorespiratory endurance. The study compares an experimental group exposed to yoga training with a control group that did not receive the intervention.

Statement of the Problem

The study was undertaken to determine the effect of selected yogasanas on the motor fitness of elementary school students.

Delimitations

- The participants were girls studying at Tamralipta Public School, Purba Medinipur, West Bengal.
- The age range of the sample was 12 to 15 years.
- The yogic programme included Surya Namaskar, Paschimottanasana, Matsyasana, Halasana, Ushtrasana, Sarvangasana, and pranayama practices (Anuloma-Viloma, Bhastrika, and Ujjayi).
- Motor fitness was examined only through flexibility, agility, and cardiorespiratory endurance.

Hypothesis

It was hypothesised that the selected yogic exercises would not produce significant change in the motor fitness variables of elementary school students.

Methodology

Participants

Thirty girls from Tamralipta Public School were selected at random for the study. Their ages ranged from 12 to 15 years, with an average age of approximately 14 years. The purpose of the investigation was explained to the students, and all of them agreed to participate.

Criterion Measures

- Flexibility: bridge-up test, recorded in centimetres.
- Agility: 6 x 10 m shuttle run, recorded in seconds to the nearest tenth.
- Cardiorespiratory endurance: Harvard step test using a 20-inch bench and a five-minute stepping protocol with recovery pulse counts.

Experimental Design

A random group design was adopted. The 30 participants were divided equally into an experimental group and a control group, each consisting of 15 students. Both groups completed pre-tests before the intervention and post-tests after the six-week experimental period.

Training Programme

The experimental group followed a planned yoga schedule for six weeks under the supervision of the investigator. Practice was conducted twice daily: 45 minutes in the morning and 45 minutes in the afternoon, except on Sundays and holidays. The control group did not undergo the yogic training and continued its regular school routine.

Statistical Treatment

Pre-test and post-test scores were compared statistically at the 0.05 level of significance. The original source tables report t-values for the main within-group and comparative analyses; those numerical values are retained here and presented in a cleaned format.

Results and Interpretation

Table 1 presents the pre-test and post-test performance of the experimental group. The mean flexibility score increased slightly from 51.167 to 52.00, but the t-value (0.298) did not reach significance. Agility improved meaningfully, with the mean time decreasing from 10.173 seconds to 9.847 seconds and a significant t-value of 5.543. Cardiorespiratory endurance also improved substantially, rising from 74.000 to 77.600 with a significant t-value of 6.758. These results suggest that the yoga programme was effective for agility and endurance, but not for flexibility within the six-week period.

Table 1. Significance of pre-test and post-test mean score differences for the experimental group

Variable	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Mean Difference	t-value
Flexibility	51.167	8.824	52.000	10.809	0.833	0.298 (NS)
Agility	10.173	0.523	9.847	0.470	0.326	5.543*
Cardiovascular endurance	74.000	10.827	77.600	9.356	3.600	6.758*

*Note. * Significant at the 0.05 level. NS = not significant. Table value of t at 14 df = 2.14.*

The coefficients of variation reported in Table 2 indicate a mixed pattern of variability. Post-test variability in flexibility remained higher in the experimental group than in the control group, whereas variability in agility and cardiorespiratory

endurance was lower in the experimental group. This suggests that the training effect was more consistent for agility and endurance than for flexibility.

Table 2. Coefficient of variation for pre-test and post-test scores

Variable	Group	Test	Mean	SD	CV
Flexibility	Group A	Pre-test	51.167	8.824	21.12
Flexibility	Group A	Post-test	52.000	10.809	16.97
Flexibility	Group B	Pre-test	52.000	8.824	16.97
Flexibility	Group B	Post-test	51.833	8.837	17.06
Agility	Group A	Pre-test	10.173	0.523	5.14
Agility	Group A	Post-test	9.847	0.470	4.77
Agility	Group B	Pre-test	10.413	0.546	5.24
Agility	Group B	Post-test	10.460	0.594	5.68
Cardiovascular endurance	Group A	Pre-test	74.000	10.817	14.62
Cardiovascular endurance	Group A	Post-test	77.600	9.356	12.06
Cardiovascular endurance	Group B	Pre-test	74.467	10.057	13.52
Cardiovascular endurance	Group B	Post-test	74.200	10.213	13.76

Note. Group A = experimental group; Group B = control group; CV = coefficient of variation.

Table 3 compares the experimental and control groups directly. The control group did not show significant change in flexibility, agility, or cardiorespiratory endurance. By contrast, the experimental group recorded significant gains in agility and endurance, while flexibility again remained non-significant. The findings therefore support the view that the training effect was specific rather than general: short-term yogasana practice influenced some motor fitness components more than others.

Table 3. Comparison of initial and final mean scores for the experimental and control groups

Variable	Group	n	Pre-test Mean	Post-test Mean	Mean Difference	t-value
Flexibility	Experimental	15	51.167	52.000	0.833	0.298 (NS)
Flexibility	Control	15	52.000	51.833	0.167	0.323 (NS)
Agility	Experimental	15	10.173	9.847	0.326	5.543*
Agility	Control	15	10.413	10.460	0.047	0.413 (NS)
Cardiovascular endurance	Experimental	15	74.000	77.600	3.600	6.758*
Cardiovascular endurance	Control	15	74.467	74.200	0.267	0.745 (NS)

*Note. * Significant at the 0.05 level. NS = not significant.*

Discussion

The findings suggest that regular yoga practice can improve selected elements of motor fitness among school girls. The improvement in agility may be explained by better neuromuscular control, balance, postural stability, and coordinated body movement resulting from repeated asana practice. Sequences such as Surya Namaskar and controlled postural transitions may also have contributed to improved movement efficiency.

The gain in cardiorespiratory endurance may be associated with the combined effect of repeated physical activity and pranayama. Controlled breathing, postural discipline, and regular practice can improve exercise tolerance and breathing rhythm, which may help students perform better on endurance-related tasks.

Flexibility showed only a marginal increase and did not reach statistical significance. A likely explanation is the relatively short duration of the intervention. Flexibility adaptations often require a longer period of repeated stretching, and the

selected programme distributed the training effect across several physical qualities rather than concentrating exclusively on range of motion.

The original null hypothesis was not supported in general, because significant gains were obtained in agility and cardiorespiratory endurance. At the same time, the hypothesis remained consistent with the non-significant result for flexibility. The study therefore points to a selective rather than universal effect of short-term yogasana practice.

Conclusion

- Selected yogasanas produced significant improvement in agility and cardiorespiratory endurance among the experimental group.
- The six-week programme did not produce a statistically significant improvement in flexibility.
- The control group showed no meaningful change in any of the variables studied.
- A school-based yoga programme may therefore be useful for enhancing specific aspects of motor fitness, especially agility and endurance.

Recommendations

- Similar studies may be conducted with larger samples and with boys as well as girls.
- The duration of yogic training may be increased in future studies to examine long-term effects, especially on flexibility.
- Replication with different age groups and regional populations may improve generalisability.
- Physical education teachers and coaches may consider using structured yoga modules to support agility and cardiorespiratory endurance.
- Further research may compare different combinations of asanas and pranayama for sport-specific performance.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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