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INTERVENTION OF A STRUCTURED SIX-WEEK YOGIC ASANA TRAINING PROGRAM ON MULTIDIMENSIONAL BALANCE PERFORMANCE: A CONTROLLED RELATIVE STUDY

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ABSTRACT

Background: Balance is a fundamental component of human movement and physical performance, involving the complex integration of visual, vestibular, and proprioceptive information to maintain postural stability and coordinate appropriate motor responses. Yogic asanas, particularly balancing postures, involve controlled body movements, sustained postural holds, concentration, and continuous neuromuscular adjustments. The present study, entitled "Intervention of a Structured Six-Week Yogic Asana Training Program on Multidimensional Balance Performance: A Controlled Relative Study," was designed to investigate the effects of a structured six-week programme of selected balancing yogic asanas on different dimensions of balance among college-aged participants. **Method:** The randomize control group design was administered for the purpose of the study and a total 40 volunteers were selected from L.N.I.P.E, Guwahati. The volunteers divided into two group consist of 20 volunteers in each group. Inclusion Criteria included are age between 19–23-year males, Dimension of balance- Range of Motion (ROM), Proprioception, Reaction Time, Coordination and Static Balance, six-week experimental training of Asana's including Warmup (1 round 8Min),Vrikshasana (3 round 3min), Eka Padasana (3round3min),Garudasana (3round 3 min), Bakasana (3 round 3 min), Merudandasana (3round 3 min), Om chanting (4 chanting 2 min) & savasana (1round 7 min) total 35 min of Asana and 3 days in a week. Before applying inferential statistic, the normality of the data distribution was assessed by Shapiro-wilk test, Kolmogorov-Spirnov Test, Histogram Analysis, Normal Q-Q Plots and Detrended Q-Q Plot. The normality test was applied to determine whether parametric or non-parametric test were appropriate. Several variables violate the normality assumption (ROM, Reaction time post-test, Statistic balance pretest etc.) as observed from the significant value and graphical deviation. Therefore, non parametric statistic technique Mann-Whitney U-Test (Between Group Comparison) and Wilcoxon signed Rank Test (Within Group Comparison) were chosen. **Result:** The control group exhibited no significant pre–post differences across any variable, confirming that mere passage of time did not influence balance performance. Conversely, the experimental group demonstrated significant gains in proprioception, reaction time and static balance, indicating that the six-week yogic asana program effectively enhanced sensory awareness and postural stability. **Conclusion:** The present investigation concludes that **a** six-week programme of selected balancing yogic asanas is effective in improving key dimensions of balance performance among young adults**.** Significant improvements were observed in proprioception, reaction time, and static balance, indicating that regular practice of balancing yogic asanas may enhance sensory-motor integration, postural control, and neuromuscular coordination. However, the intervention did not produce comparable improvements in range of motion and coordination**,** suggesting that these components may require a longer training duration, greater training volume, or more specifically targeted yogic practices.

KEYPOINTS: Proprioception, Asanas, Wilcoxon signed Rank Test, Shapiro-wilk test, Kolmogorov-Spirnov & Range of Motion (ROM).

INTRODUCTION

Yoga is an ancient Indian system of knowledge that has evolved over more than 5000 years and focuses on creating harmony between the body, mind, and environment. Over centuries, yoga has evolved into a versatile approach to wellness that enhances strength, flexibility, focus, and inner stability. Today it is widely used not only for fitness but also for stress management, rehabilitation and performance enhancement. As described in the texts, the term "Yoga" originates from the Sanskrit word *"yuj"*, meaning to unite or integrate, reflecting the unification of one's physical, mental, and spiritual dimensions. Yoga explains that human wellbeing depends on maintaining balance with innersole and with the surrounding environment. And this can be achieved through not merely with the practice of asana but also including controlled breathing, mindful movement, meditation in the daily lifestyle. Integrating yoga into everyday life provides a simple and effective way to maintain overall fitness and well-being. Unlike traditional exercise routines that focus mainly on muscular strength or endurance, yoga combines physical postures, controlled breathing and mindful attention. This combination helps improve flexibility, posture, balance, circulation and relaxation at the same time. Regular yogic practice can be adapted for individuals of all ages because many postures require minimal space and no equipment. Short daily sessions—such as light stretching in the morning, breathing exercises during breaks, or relaxation practice before sleep can significantly enhance both physical health and mental calmness.

For athletes, yoga serves as a complementary training tool that sharpens body awareness, reduces injury risk and improves movement efficiency and help in improving overall performance in sports. Thus, adding yoga to daily routines supports a balanced lifestyle that strengthens the body while calming the mind. In the context of physical balance, yogic asanas—particularly balancing postures—play a vital role in strengthening stabilizer muscles, improving proprioception, enhancing neuromuscular coordination, and building controlled mobility. Scientific studies have shown that consistent practice of balancing Yoga asanas can improve static and dynamic balance, postural control, lower limb strength, and functional performance in individuals of all age groups **(Gordon et al., 2013; Sharma & Sharma, 2019).** A structured six-week Yoga intervention focusing on selected balancing asanas provides an ideal time frame to observe measurable changes in postural stability and balance-related parameters. Balancing asanas such as Vrikshasana (Tree Pose), Natarajasana (Dancer Pose), Garudasana (Eagle Pose) and Bakasana (Crane Pose) demand strong engagement of the core, ankle stability, controlled breathing, and sustained concentration. These factors work together to influence various dimensions of balance—namely static balance, dynamic balance, proprioceptive sensitivity, and neuromuscular responsiveness.

Given the increasing importance of balance in sports performance, injury prevention, healthy aging, and functional movement, understanding the effect of a structured Yogic balancing program becomes highly relevant. Thus, the present study aims to investigate the effect of six-week selected balancing Yogic asanas on different dimensions of balance, contributing valuable evidence to the growing body of research in Yogic science and physical education.

MATERIALS AND METHODS

Research Design

Randomized control group design examines the forty students from among those who were willing to participate was selected as volunteers. The volunteers were tested prior to the commencement of experimental intervention and after completion of six weeks of experimental intervention. One group underwent purely asana practice and one group served as a control group (did not receive any training intervention). Only between-group comparisons using Independent Sample t-tests on change scores (Post−Pre) were used to determine the training effect.

Subject

To achieve the purpose of the study a total of 40 subjects were selected from LNIPE, Guwahati. They were segregated into two groups consisting of 20 subjects in each group. The allotment of one experimental group and one control group was done**. Inclusion Criteria** included are age between 19–23-year males, Dimension of balance- Range of Motion(ROM), Proprioception, Reaction Time, Coordination and Static Balance, six-week experimental training of Asana's including Warmup (1 round 8Min),Vrikshasana (3 round 3min), Eka Padasana (3round 3 min) , Garudasana (3round 3 min), Bakasana (3 round 3 min), Merudandasana (3round 3 min), Om chanting (4 chanting 2 min) & savasana (1round 7 min) total 35 min of Asana and 3 days in a week. The exclusion criteria are the volunteer having health disorder in last three months, hereditary influence, Bone and Muscles injuries, dietary and the life style habit.

Outcome Measures

The Study was conducted on the multiple dimensions of balance including Range of Motion (ROM), proprioception, Reaction Time, Coordination and Static Balance. For this purpose, the Sensamove Balance system by B.M.S (Baseline measurement Software) were used was available at L.N.I.P.E, N.E.R.C, Guwahati Exercise Physiology Laboratory. The baseline data of the variable were collected week one (Before Training) and Final Data week six (After training). This computerized Sensamove provides accurate measurement of the variable mentioning in **Table-1.**

Table-1: Description Of Criterion Measure.

S. No.	Variable	Test	Unit
1.	Static balance	Sensmove Device with Baseline Measurement Software	Degree
2.	Range of motion	Sensmove Device with Baseline Measurement Software	Degree
3.	Coordination for dynamic balance	Sensmove Device with Baseline Measurement Software	Degree
4.	Proprioception for dynamic balance	Sensmove Device with Baseline Measurement Software	Degree
5.	Reaction time for dynamic balance	Sensmove Device with Baseline Measurement Software	Second

Statistical Analysis

In order to analysis the hypothesis and data from the experimental and control group before and after six weeks of yoga intervention, before applying inferential statistic, the normality of the data distribution was assessed by Shapiro-wilk test, Kolmogorov-Spirnov Test, Histogram Analysis, Normal Q-Q Plots and Detrended Q-Q Plot. The normality test was applied to determine whether parametric or non-parametric test were appropriate. Several variables violate the normality assumption (ROM, Reaction time post-test, Statistic balance pretest etc.) as observed from the significant value and graphical deviation. Therefore, non parametric statistic technique Mann-Whitney U-Test (Between Group Comparison) and Wilcoxon signed Rank Test (Within Group Comparison) were chosen.

RESULT

Descriptive statistics including the number of participants, Mean, Standard Deviation of the Pre and Post data of all the variable of control group as well as experimental group.

Table -2: Descriptive Statistics of Mean and Standard Deviation of Pre and Post of all Groups.

Variable	Group	N	Pre Test (Mean & S.D)	Post Test (Mean & S.D)
ROM	Control	20	10.07± .33	10.08±.36
	Experimental	20	10.06±.05	10.17±.25
Proprioception	Control	20	91.45±24.64	83.63±18.59
	Experimental	20	73.08±28.69	97.20±24.77
Reaction Time	Control	20	2.22±1.03	2.45±.90
	Experimental	20	1.73±.63	1.26±.32
Coordination	Control	20	4.28±2.24	3.53±2.17
	Experimental	20	3.92±1.78	4.65±2.99
Static Balance	Control	20	2.78±.62	2.84±.56
	Experimental	20	2.74±.46	2.65±.49

Note: ROM -Range of Motion, N- Number of Participant.

Normality testing was performed for all variables—Range of Motion (ROM), Proprioception, Reaction Time, Coordination, and Static Balance—for both the experimental and control groups in order to determine the suitability of parametric or non-parametric statistical procedures. The analysis was conducted using the Kolmogorov–Smirnov and Shapiro–Wilk tests, accompanied by visual inspections of histograms, Q–Q plots, and detrended Q–Q plots and presented in **Table-3.**

Table-3: Result of the Normality Test (Control & Experimental Group).

Variable	Group	Kolmogorov- Smirnov				Shapiro-Wilk		
		Data	Statistic	DF	Sig	Statistic	DF	Sig
ROM	Control	Pre	.144	20	.200	.959	20	.556
		Post	.202	20	.032	.826	20	.002
	Experimental	Pre	.202	20	.032	.753	20	.000
		Post	.167	20	.145	.900	20	.041
Proprio-ception	Control	Pre	.182	20	.098	.949	20	.374
		Post	.104	20	.200	.954	20	.426
	Experimental	Pre	.106	20	.200	.973	20	.811
		Post	.149	20	.200	.958	20	.503
Reaction Time	Control	Pre	.169	20	.159	.862	20	.010
		Post	.131	20	.200	.950	20	.368
	Experimental	Pre	.172	20	.122	.917	20	.087
		Post	.272	20	.000	.851	20	.005
Coordination	Control	Pre	.180	20	.105	.927	20	.151
		Post	.221	20	.012	.711	20	.000
	Experimental	Pre	.172	20	.933	.933	20	.180
		Post	.241	20	.788	.988	20	.001
Statistical Balance	Control	Pre	.177	20	.121	.858	20	.008
		Post	.105	20	.200	.987	20	.992
	Experimental	Pre	.191	20	.890	.890	20	.026
		Post	.192	20	.907	.907	20	.056

In **Table-3**, ROM Post (p = .002), Reaction Time Pre (p = .010), Coordination Post (p = .000), and Static Balance Pre (p = .008) all showed Shapiro–Wilk significance values less than 0.05, indicating statistically significant deviations from normality. Some variables, such as Proprioception Pre (p=.374) and Static Coordination Pre (p=.151), exhibited marginally acceptable p-values, yet the accompanying Q–Q visualizations suggested noticeable deviations, particularly at the tails.

For the experimental group, the Shapiro–Wilk significance values indicated that multiple variables deviated from normal distribution. ROM (Pre: p = .000; Post: p =.041), Reaction Time (Pre: p = .087; Post: p = 0.005), Coordination (Pre: p = .180; Post: p = .001), and Static Balance (Pre: p = .026; Post: p = .056) all showed p-values below the conventional threshold of 0.05 in at least one measurement period, confirming non-normality. Only Proprioception (Pre: p = .811; Post: p = .503) demonstrated normal distribution characteristics.

Taken together, the statistical outputs from both groups clearly shows that most of the variables lacked normal distribution across both pre- and post-testing phases. The combination of significant Shapiro–Wilk values (< .05) and visually non-linear Q–Q plot patterns provided strong justification for rejecting the assumption of normality. The Wilcoxon Signed-Rank Test was used for within-group comparisons, and the Mann–Whitney U Test was used for between-group comparisons, ensuring statistical robustness and validity given the characteristics of the dataset.

The Wilcoxon Matched-Pairs Signed Rank Test was employed to examine the within-group changes from pre-test to post-test across five balance-related variables – Range of Motion (ROM), Proprioception, Reaction Time, Coordination, and Static Balance – for both the experimental and control groups.

Table-4: Result of the Wilcoxon Matched -Pairs Signed Rank Test of Control and Experimental Group.

Variable	Group	Null Hypothesis	Test	Sig.
ROM	**Control**	The median of differences between PRE and POST equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Retain the null hypothesis	**.794**
	Experimental	The median of differences between PRE and POST equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Retain the null hypothesis	**.965**
Reaction Time	**Control**	The median of differences between PRE and POST Equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Retain the null hypothesis.	**.218**
	Experimental	The median of differences between PRE and POST Equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Reject the null hypothesis.	**0.14***
Coordination	**Control**	The median of differences between PRE and POST equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Retain the Null Hypothesis	**.117**
	Experimental	The median of differences between PRE and POST equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Retain the Null Hypothesis	**.955**
Static Balance	**Control**	The median of differences between PRE and POST equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Retain the Null Hypothesis	**.411**
	Experimental	The median of differences between PRE and POST equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Reject the Null Hypothesis	**.003***
Proprioception	**Control**	The median of differences between PRE and POST equals 0.	Related-samples wilcoxon Signed rank test **DECISION** Retain the Null Hypothesis	**.433**
	Experimental	The median of differences between PRE	Related-samples wilcoxon	**.022***

		and POST equals 0.	Signed rank test **DECISION** Reject the Null Hypothesis	

***Significant at 0.05**.

The above table reveals that, the ***P-Value*** of ROM in control and experimental group were **.794** and **.956** respectively which was much higher than the **0.05 level**. Which shows the insignificant difference between Pre test and Post test of control as well as in experimental group. Thus, the Null hypothesis is therefore accepted.

In respect to the Reaction time the ***P-Value*** were **.218** and **.014*** respectively. Which shows control group were insignificant where ***P-Value*** were higher than 0.05 and the null hypothesis were accepted. Whereas the experimental group shows statistically significant improvement in relation to time and the null hypothesis were rejected. The ***P-value*** of coordination abilities of control and experimental group were **.117** & **.955** respectively and shows higher than **0.05** level which clearly indicate insignificant difference between the Pre test and Post Test of Control as well as in experimental group. Thus, the Null hypothesis therefor Accepted. In case of statistic balance the ***P-value*** of control and experimental group were **.411** and **.003*** respectively which shows control group were insignificant where ***P-Value*** shows higher than **0.05** level and null hypothesis were accepted, whereas the experimental group statistically significant in pre and post result with P value ***0.03*.*** Therefore, the Null Hypothesis were rejected. In Fifth variable of the study, the proprioception P-value of control and experimental group were ***.433*** and ***.022****respectively which shows control group was insignificant where P-Value were higher than ***0.05*** level and null hypothesis were accepted. Where as the experimental group shows statistically significant in Pre-Post result with ***P-value*** *.022**, therefore null hypothesis were rejected. Taken together, the Wilcoxon analysis highlights a clear difference between groups. The control group exhibited no significant pre–post differences across any variable, confirming that mere passage of time did not influence balance performance. Conversely, the experimental group demonstrated significant gains in proprioception, reaction time and static balance, indicating that the six-week yogic asana program effectively enhanced sensory awareness and postural stability. These results support the conclusion that balancing yogic asanas have a measurable and positive effect on neuromuscular functioning, particularly in sensory feedback and postural control mechanisms.

Mann–Whitney U Test Results

The Mann–Whitney U test was used to compare the experimental and control groups on all performance variables during both the pre-test and post-test phases. This non-parametric test was selected because the data did not meet the assumption of normality, and the groups were independent. The results provide insight into whether the two groups were statistically equivalent at baseline and whether the six-week yogic asana intervention created significant differences in performance outcomes.

Table-5: Mann–Whitney U Test for Between-Group Comparison of Pre-Test Scores.

	GROUP	N	Mean Rank	Sum of Ranks
ROM	PRE_EXP	20	20.18	403.50
	PRE_CONTROL	20	20.83	416.50
	Total	40		
PROPREOCEPTION	PRE_EXP	20	13.65	273.00
	PRE_CONTROL	20	27.35	547.00
	Total	40		
REACTION_TIME	PRE_EXP	20	25.78	515.50
	PRE_CONTROL	20	15.23	304.50
	Total	40		
COORDINATION	PRE_EXP	20	19.60	392.00
	PRE_CONTROL	20	21.40	428.00
	Total	40		
STATIC_BALANCE	PRE_EXP	20	14.70	294.00
	PRE_CONTROL	20	26.30	526.00
	Total	40		

Table-6: Mann–Whitney U Test for Between-Group Test Result.

	ROM	Proprioception	Reaction Time	Coordination	Static-Balance
Mann-whitney u	193.500	63.000	94.500	182.000	84.000
Wilcoxon W	403.500	273.000	304.500	392.000	294.000
Z	-.176	-3.706	-2.857	-.487	-3.139
Asymp. Sig. (2-tailed)	.860	.000	.004	.626	.002

Exact Sig. [2*(1-tailed Sig.)]	.862[b]	.000[b]	.004[b]	.640[b]	.001[b]

Pre-Test Inter-Group Comparison

Before the intervention, the Mann–Whitney U test indicated that the majority of variables did not differ significantly between the experimental and control groups. For ROM, the mean ranks of the experimental (20.18) and control (20.83) groups were nearly identical, reflected by a non-significant p-value of 0.860, confirming that both groups began with similar joint mobility levels. A similar result was found for Coordination, where p = 0.626, again showing no meaningful difference between groups.

However, two variables showed significant baseline differences. Proprioception demonstrated a large difference in mean ranks (13.65 vs. 27.35), and the Mann–Whitney U value of 63.000 resulted in a p-value of 0.000, indicating that the control group had significantly better proprioceptive ability before the intervention. Additionally, Reaction Time showed a significant difference (U = 94.500, p = 0.004), with the experimental group displaying slower reaction times at baseline. Lastly, Static Balance also differed significantly (U = 84.000, p = 0.002), with the control group performing better. These patterns suggested that the experimental group entered the study with poorer sensory-motor functioning, making improvements after the intervention particularly meaningful.

Table-7: Mann–Whitney U Test for Between-Group Comparison of Post-Test Scores.

	Group	N	Mean Rank	Sum of Ranks
ROM	POST_EXP	20	22.78	455.50
	POST_CONTROL	20	18.23	364.50
	Total	40		
PROPREOCEPTION	POST_EXP	20	26.03	520.50
	POST_CONTROL	20	14.98	299.50
	Total	40		
REACTION_TIME	POST_EXP	20	12.95	259.00
	POST_CONTROL	20	28.05	561.00
	Total	40		
COORDINATION	POST_EXP	20	23.65	473.00
	POST_CONTROL	20	17.35	347.00
	Total	40		
STATIC_BALANCE	POST_EXP	20	25.60	512.00
	POST_CONTROL	20	15.40	308.00
	Total	40		

Table-8:' Mann–Whitney U Test for Between-Group Test Result.

	Rom	Propreoception	Reaction Time	Coordination	Static Balance
Mann-whitney u	154.500	89.500	49.000	137.000	98.000
Wilcoxon W	364.500	299.500	259.000	347.000	308.000
Z	-1.233	-2.989	-4.089	-1.706	-2.760
Asymp. Sig. (2-tailed)	.217	.003	.000	.088	.006
Exact Sig. [2*(1-tailed Sig.)]	.221[b]	.002[b]	.000[b]	.091[b]	.005[b]

After six weeks, the Mann–Whitney U test showed a substantial shift in outcomes between both groups. For ROM, the experimental group achieved a higher mean rank (22.78) compared to the control group (18.23), though the difference remained statistically non-significant (p = 0.217). This suggests that the intervention improved ROM but did not create a statistically strong difference between groups.

In contrast, significant improvements were observed in several neuro-motor variables. Proprioception showed a clearly higher mean rank in the experimental group (26.03 vs. 14.98), with a Mann–Whitney U of 89.500 and a p-value of 0.003, demonstrating that the intervention produced measurable gains in joint position sense. Reaction Time, where a decrease indicates improvement, revealed the strongest shift: the experimental group had significantly faster reaction times than the control group (mean ranks 12.95 vs. 28.05), reflected by a highly significant p-value of 0.000. This reversal compared to the pre-test results indicates the intervention had a powerful impact on neuromuscular responsiveness.

For Coordination, the experimental group again outperformed the control group (mean rank 23.65 vs. 17.35). Although the p-value of 0.088 did not meet the 0.05 threshold, the trend strongly suggested better performance in the group receiving yogic balancing asanas. Finally, Static Balance showed a significant improvement (U = 98.000, p = 0.006), with the experimental group achieving a much higher mean rank

(25.60) than the control group (15.40). This confirms that the yogic intervention notably enhanced postural stability in comparison to standard conditions.

Overall, the Mann–Whitney analysis demonstrated that although the groups were largely comparable at baseline, the experimental group showed considerably greater improvements by the end of the six-week period. Significant differences emerged in Proprioception, Reaction Time, and Static Balance, all favouring the experimental group. These results indicate that the selected balancing yogic asanas had a strong and positive influence on sensory-motor control, neuromuscular speed, and postural stability. Variables such as ROM and Coordination improved in the expected direction, but the between-group differences did not reach statistical significance. Taken together, the f.

DISCUSSION OF FINDING

The purpose of this study was to examine the effect of six weeks of selected balancing yogic asanas on different dimensions of balance, including static balance, proprioception, coordination, reaction time, and range of motion, among college-aged participants. The findings from both within-group (Wilcoxon test) and between-group (Mann–Whitney U test) analyses provide valuable insight into how the intervention influenced balance-related performance. Overall, the results clearly indicate that the experimental group demonstrated improvement in several balance dimensions, while the control group showed no significant changes, highlighting the effectiveness of the yogic asanas.

The control group was assessed first to understand the natural progression of balance ability without any intervention. The Wilcoxon results for the control group showed that none of the variables—range of motion, proprioception, reaction time, coordination, or static balance—achieved statistical significance, with all p-values exceeding the .05 level. These findings confirm that the participants in the control group maintained nearly the same level of performance from pre-test to post-test. Since they did not undergo any structured training, the lack of improvements reflects natural stability in their neuromuscular functioning. This result is consistent with the expectation that balance skills do not improve automatically without targeted practice, reinforcing the importance of specific intervention programs.

In contrast, the experimental group displayed notable changes following the six-week yogic balance training program. The Wilcoxon test results revealed statistically significant improvements in reaction time ($p = .014$), static balance ($p = .003$), and proprioception ($p = .022$). These changes suggest that the intervention had a positive influence on neuromuscular coordination, sensory integration, and postural control. Yogic asanas that emphasize slow, controlled movements and sustained postural holds may have contributed to enhanced sensory feedback, leading to improvements in proprioception. The significant reduction in reaction time indicates quicker neuromuscular responses, likely due to better mind–body coordination and improved central nervous system processing. Similarly, improved static balance can be attributed to the continuous engagement of stabilizing muscles and the increased ability to maintain center of gravity, which is a fundamental aspect of balancing asanas.

However, the experimental group did not show statistically significant improvement in range of motion ($p = .965$) and coordination ($p = .955$). The lack of improvement in range of motion could be due to the nature of the selected yogic asanas, which might have focused more on balance and stability rather than flexibility-related movements. Similarly, the non-significant change in coordination suggests that the selected asanas may not have placed enough demand on dynamic, full-body movement patterns that are typically necessary for improving coordination. These findings highlight that while yogic asanas are effective for enhancing certain balance components, more dynamic or task-specific exercises may be required for measurable improvement in coordination and mobility-related outcomes.

The between-group comparison using the Mann–Whitney U test further strengthens the findings. The experimental group outperformed the control group in proprioception, reaction time, and static balance in post-test comparisons, demonstrating statistically significant differences between the groups. This indicates that the intervention had a measurable and superior effect compared to natural changes seen in the control group. The results align with previous research that supports the use of yoga for improving sensory–motor functioning and balance control. Studies have shown that yogic practices enhance body awareness, strengthen postural muscles, and improve neural communication pathways, all of which contribute to better balance performance.

Overall, the findings of this study support the hypothesis that six weeks of balancing yogic asanas can meaningfully improve specific dimensions of balance. While not all variables showed significant change, the improvements in reaction time, proprioception, and static balance demonstrate the effectiveness of yogic interventions in enhancing neuromuscular functioning. The results highlight the potential of yoga as a safe, accessible, and holistic training approach for improving balance and posture among young adults. Future research may explore longer training durations, include more dynamic coordination-based asanas, or expand the sample size to observe broader effects on all balance-related variables.

CONCLUSION

Overall, the present investigation provides evidence that **a** six-week programme of selected balancing yogic asanas can produce significant improvements in proprioception, reaction time, and static balance among young adults, whereas range of motion and coordination may require a longer duration, greater training volume, or more specifically targeted exercises to demonstrate measurable adaptation. The findings therefore support the effectiveness of yogic practices as a practical, accessible, and low-cost intervention for developing selected components of balance and neuromuscular function. At the same time, the selective nature of the observed adaptations highlights the importance of intervention specificity and suggests that future research should examine longer-duration programmes, larger samples, dynamic and task-specific yogic sequences, and objective biomechanical and neuromuscular measures to further clarify the mechanisms and extent of these adaptations.

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