Original Article

Effect of Indigenous Game on Selected Physical Psychological Variables of University Students

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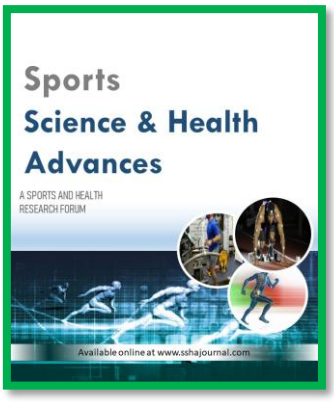


Peer-Reviewed
Refereed
Indexed

How to cite: Kumar, S., Tarun, T., Singh, A., Verma, M. K., & Chaudhary, S. (2025). Effect of Indigenous Game on Selected Physical Psychological Variables of University Students. *Sports Science & Health Advances*. 3(2), 538-543. https://doi.org/10.60081/SSHA.3.2.2025.538-543

Received: 28-09-2025
Accepted: 30-10-2025
Published: 30-12-2025

Abstract

Purpose: This study aimed to investigate the impact of indigenous games on selected physical and psychological variables among university students. **Background:** Indigenous games have long been woven into the cultural fabric of Indian society, functioning as tools for physical fitness, cultural expression, and social interaction. Despite their relevance, their potential influence on contemporary student development in higher education remains underexplored. **Material and Methods**: Twenty-eight postgraduate students (aged 22–27 years) from the Central University of Punjab were recruited using purposive random sampling. Participants were divided into an experimental group (n = 14) and a control group (n = 14). The experimental group engaged in an 8-week structured indigenous games program featuring Pithu, Gilli Danda, Stapoo, Dog and the Bone, Kancha, and Buroinjin, while the control group received no intervention. Pre- and post-test data were collected using standardized assessment tools. Data analysis employed the Shapiro–Wilk test, Levene's test, and ANCOVA at a 0.05 significance level. **Results**: The experimental group showed significant improvements in agility, balance, eye–hand coordination, and attention compared to the control group ($p < 0.05$). Effect sizes ranged from 0.79 to 0.91, indicating large and practically meaningful effects. **Conclusion:** Participation in indigenous games led to substantial gains in both physical and psychological parameters among university students. These findings highlight the effectiveness of indigenous games as culturally relevant, cost-efficient, and engaging alternatives to conventional training approaches in higher education.

Keywords: Indigenous games, agility, balance, eye–hand coordination, attention, university students

Introduction

Sport and physical activity have always held a significant place in the cultural and civilization of India. Since the Vedic period, indigenous games and physical exercises have been viewed as essential for promoting physical development, mental discipline, and social

cohesion. Archaeological evidence from the Indus Valley Civilization indicates the presence of organized games, contests, and recreational practices that laid the groundwork for Indian physical culture (Dhanjal, 2022). Alongside spiritual traditions such as Pranayama, Yogasana, and Surya Namaskar, indigenous games like Gilli Danda, Kho-Kho, Kabaddi, and Kancha have been passed down through generations (Dhanjal, 2022; Kaur & Chander, 2015). These activities were not merely for recreation; they also served as effective educational tools, fostering discipline, cooperation, courage, and resilience among the youth. In recent decades, however, the growing popularity of global sports such as cricket, football, and basketball has overshadowed these indigenous games, contributing to their gradual decline (Nasim, 2019). Factors like rapid urbanization, reduced access to open spaces, and changing lifestyles have further marginalized these traditional practices. Despite this downturn, there is now a renewed recognition of the value of indigenous games as resources for holistic development. Their affordability, inclusiveness, and deep cultural significance make them powerful tools for enhancing both physical fitness and psychological well-being among today's youth (Shliakhovchuk, 2019).

Research has consistently shown that indigenous games significantly contribute to various aspects of motor development. Games like "Dog and the Bone" and "Stapoo" promote quick decision-making and explosive movements, enhancing agility and reaction times. Similarly, activities such as "Gilli Danda" and "Pithu" challenge players to strike or catch small, fast-moving objects, thus stimulating eye–hand coordination. Balance-focused games, including "Kancha" and "Buroinjin," help cultivate postural control and overall stability (Mohammadi et al., 2021). These motor skills form the foundation of athletic performance and are essential components of long-term physical literacy (Whitehead, 2010). At the international level, researchers have underscored the importance of traditional games in developing fundamental movement skills (FMS). For example, Sabzis (2023) reported that participation in traditional dodgeball significantly enhanced agility and motor control among university students. Similarly, Fauzi et al. (2023) demonstrated that engaging in Malay indigenous games improved balance, coordination, and motivation for physical activity. These findings reaffirm that playful, dynamic, and culturally embedded activities can provide physiological and psychological benefits comparable to those achieved through structured exercise programs.

Indigenous games offer significant psychological and cognitive benefits beyond physical development. Many of these activities require sustained concentration, strategic thinking, and teamwork, which enhance attention, mental flexibility, and problem-solving skills. For instance, the game Stapoo demands visual focus, precision, and sequential memory, while Dog and the Bone encourages quick decision-making under pressure. Empirical research suggests that these activities strengthen executive functioning and attentional control in young people (Best, 2010). Orangi et al. (2021) reported that Iranian students participating in indigenous games demonstrated significant improvements not only in motor skills but also in psychological areas such as confidence and concentration. Overall, these outcomes emphasize that traditional games foster both physical competence and mental resilience qualities that are particularly valuable for university students facing the challenges of academic life.

University life is often linked to increased sedentary behavior, primarily due to academic demands, prolonged screen time, and limited opportunities for physical activity (Irwin, 2004). This lack of activity can lead to declines in physical fitness and negatively affect mental health, resulting in reduced attention spans, increased stress, and diminished social interaction. Incorporating indigenous games into university settings provides a culturally relevant, cost-effective, and enjoyable way to tackle these issues. These activities require minimal infrastructure, can be organized in small groups, and promote a socially engaging environment that enhances student well-being. Although there is a growing body of literature in India and beyond highlighting the cultural and historical significance of indigenous games, relatively few studies have utilized rigorous research designs to assess their impact on university students' physical and psychological outcomes. Much of the existing research is descriptive, historical, or policy-focused (Anderson, 2007; Dart, 2017), creating a noticeable gap in evidence concerning measurable domains such as agility,

balance, coordination, and attention. Furthermore, most intervention studies have primarily targeted school-aged children, with significantly less attention given to young adults who are particularly at risk for sedentary lifestyles during their higher education years.

Material and Methods

This study adopted a randomized control group pre-test–post-test design to investigate the effects of an eight-week indigenous games training program on selected physical and psychological variables among postgraduate students of the Central University of Punjab. Twenty-eight participants (14 males, 14 females), aged 22–27 years, were purposively sampled and randomly assigned to either an experimental group (n = 14) or a control group (n = 14). The experimental group underwent structured indigenous games training three sessions per week for eight weeks, while the control group continued with their usual routines. The dependent variables assessed were agility, balance, eye–hand coordination, and attention, all measured using standardized and validated instruments. Pre-test measurements were collected one day prior to the intervention and post-test measurements one day after, with familiarization trials and standardized procedures employed to minimize bias. Data were analyzed using analysis of covariance (ANCOVA) to compare adjusted group means while controlling for baseline differences. The assumptions of normality and homogeneity of variance were verified prior to analysis. Effect sizes were reported using partial eta squared (η^2) to evaluate the magnitude of the intervention effects. Statistical significance was set at $p < 0.05$ for all comparisons.

Table 1 Training Program

	Activity	1st to 2nd weeks (40minutes)	3rd to 4th weeks (50minutes)	5th to 6th weeks (60minutes)	7th to 8th weeks (60minutes)
Monday	Warm up (Jog and Dynamic stretching)	10	10	10	05
	Pithu	10	15	20	25
	Stapoo	10	15	20	25
	Limbering Down	10	10	10	5
Wednesday	Warm up (Jog and Dynamic stretching)	10	10	10	05
	Gilli Danda	10	15	20	25
	Dog and Bone	10	15	20	25
	Limbering Down	10	10	10	5
Friday	Warm up (Jog and Dynamic stretching)	10	10	10	05
	Kancha	10	15	20	25
	Buroinjin	10	15	20	25
	Limbering Down	10	10	10	5

Results

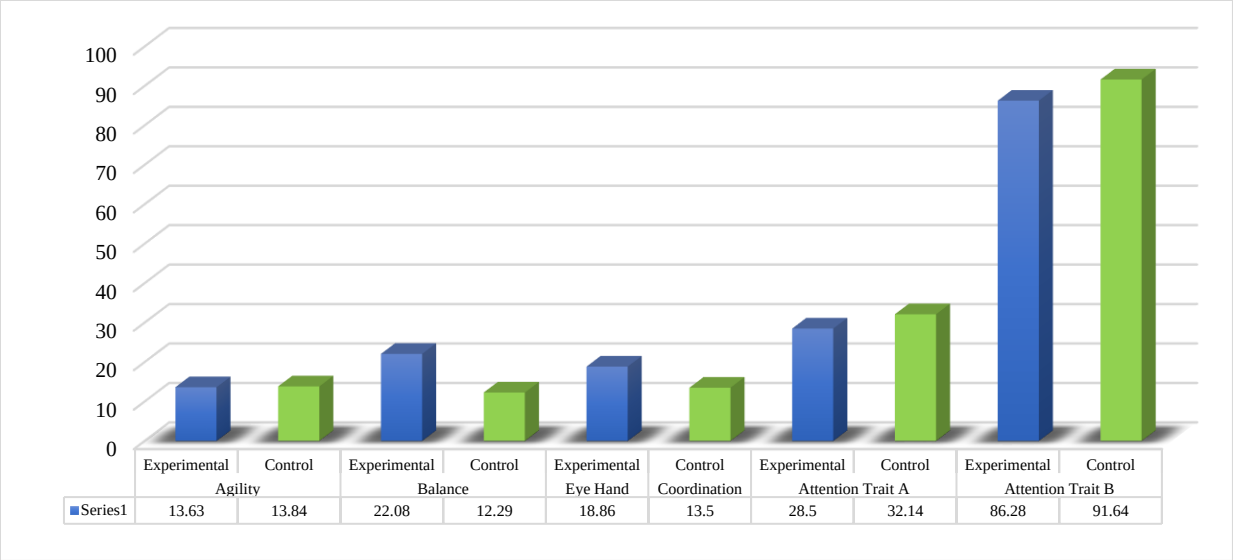
The assumption of normality was assessed using the Shapiro-Wilk test (Shapiro & Wilk, 1965). The variables for balance, eye-hand coordination, Attention Trait A, and Attention Trait B satisfied the assumption of normality ($p > 0.05$). In contrast, agility significantly deviated from normality in both groups ($p < 0.05$). Homogeneity of variance was evaluated using Levene's test. The assumption was upheld for post-test agility, eye-hand coordination, Attention Trait A, and Attention Trait B ($p > 0.05$), indicating that the variances across groups were equal. However, for balance, Levene's test indicated a significant result ($p < 0.05$), suggesting a violation of the homogeneity of variance assumption. Overall, the assumptions for ANCOVA were adequately met for all outcome variables except for balance.

Table 2 **Mean and Standard Deviation of Variables of Post Treatment Groups**

Variables	Treatments	Mean	Standard Deviation	N
Agility	Experimental	13.63	0.61	14
	Control	13.84	0.64	14
Balance	Experimental	22.08	3.83	14
	Control	12.29	3.18	14
Eye Hand Coordination	Experimental	18.86	1.66	14
	Control	13.50	1.65	14
Attention Trait A	Experimental	28.50	2.71	14
	Control	32.14	4.45	14
Attention Trait B	Experimental	86.28	6.23	14
	Control	91.64	7.31	14

The descriptive statistics shown in Table 1 reveal that the experimental group achieved higher post-test mean scores in Agility (M = 13.63, SD = 0.61), Balance (M = 22.08, SD = 3.83) and Eye-Hand Coordination (M = 18.86, SD = 1.66) compared to the control group, indicating better motor performance. Whereas, in case of psychological variables also, the experimental group exhibited better mean scores in Attention Trait A (M = 32.14, SD = 4.45) and Attention Trait B (M = 91.64, SD = 7.31), suggesting that they had comparatively improved attentional performance than control group. These trends are further illustrated in Figure 1.

Figure 1 Illustration of Mean Scores of Physical and Psychological Variables



The results presented in Table 2 indicate statistically significant treatment effects for all dependent variables after adjusting for baseline (pre-test) scores. Specifically, Agility showed a significant intervention effect, with $F(1, 25) = 96.46$ and $p < .001$, resulting in a large effect size (partial $\eta^2 = .794$). Similarly, significant effects were found for Balance, $F(1, 25) = 113.13$, $p < .001$, with a partial η^2 of .819, and for Eye-Hand Coordination, $F(1, 25) = 260.57$, $p < .001$, with a partial η^2 of .912. These results indicate marked improvements in motor performance among the experimental group.

In terms of psychological outcomes, significant treatment effects were also observed for Attention Trait A, $F(1, 25) = 138.00$, $p < .001$, with a partial η^2 of .847, and Attention Trait B, $F(1, 25) = 158.26$, $p < .001$, with a partial η^2 of .864. The consistently large effect sizes across all variables highlight the substantial and robust impact of the indigenous game's intervention on both motor and cognitive domains.

Table 2 ANCOVA Table for the Post-treatment Data of Dependent Variables

Variables	Source	Type III Sum of Squares	DF	Mean Square	F	Sig.	Effect Size
Agility	Pre-Agility	10.38	1	10.38	10614.93	.000	.998
	Treatment	.094	1	.094	96.46	.000	.794
	Error	.024	25	.001			
	Corrected Total	10.73	27				
Balance	Pre-Balance	211.49	1	211.49	47.93	.000	.657
	Treatment	499.11	1	499.11	113.13	.000	.819
	Error	110.23	25	4.41			
	Corrected Total	992.10	27				
Eye Hand Coordination	Pre-Eye Hand Coordination	53.21	1	53.21	73.90	.000	.747
	Treatment	187.61	1	187.61	260.57	.000	.912
	Error	18.00	25	.720			
	Corrected Total	272.10	27				
Attention Trait A	Pre- Attention Trait A	336.38	1	336.38	499.74	.000	.952
	Treatment	92.89	1	92.89	138.00	.000	.847
	Error	16.82	25	.63			
	Corrected Total	446.10	27				
Attention Trait B	Pre-Attention Trait B	1176.01	1	1176.01	1221.93	.000	.980
	Treatment	152.31	1	152.31	158.26	.000	.864
	Error	24.06	25	.96			
	Corrected Total	1400.96	27				

Discussions

The current study demonstrated that participation in an eight-week indigenous games program significantly improved various physical and psychological aspects among university students. The experimental group showed considerable enhancements in agility, balance, and eye-hand coordination compared to the control group, highlighting the effectiveness of culturally embedded traditional games in fostering motor skill development. These findings align with previous research that emphasizes the role of indigenous games in improving fundamental movement skills and motor proficiency (Orangi et al., 2021; Whitehead, 2010). The large effect sizes observed particularly for eye-hand coordination ($\eta^2 = .912$) and balance ($\eta^2 = .819$) underscore the practical significance of these improvements for physical fitness in higher education settings.

The study revealed significant improvements in attention-related traits among the experimental group, supporting previous research that highlights the cognitive benefits of traditional games requiring sustained concentration, quick decision-making, and strategic planning (Best, 2010). The increases in Attention Trait A and Trait B, with large effect sizes ($\eta^2 = .847$ and .864, respectively), suggest that indigenous games can be powerful tools for enhancing executive functioning and attentional control—skills that are crucial for academic success and mental resilience in university populations (Orangi et al., 2021). Moreover, the equivalent agility mean scores between the groups prior to the intervention, alongside the significant improvement observed in the experimental group post-intervention, underscores the effectiveness of dynamic, fast-paced activities such as Dog and the Bone and Stapoo in fostering rapid motor responses and reaction times (Sabzis, 2023). Although there was a violation of homogeneity of variance, the improvement in balance may indicate the effectiveness of balance-focused indigenous games like Kancha and Buroinjin in positively influencing postural control, aligning with international studies on traditional games (Fauzi et al., 2023).

Collectively, these results affirm indigenous games as culturally meaningful, cost-effective interventions that can holistically enhance physical fitness and cognitive function among young adults in higher education (Nasim, 2019; Shliakhovchuk, 2019). Introducing these games within university curricula may offer a viable strategy to combat sedentary behavior and nurture both physical and psychological well-being. Further research should investigate the long-term effects, gender-specific responses, and the potential for scaling indigenous game interventions in various higher education contexts. This study provides

valuable empirical evidence in a relatively underexplored area, serving as a foundation for policymakers and educators to redesign culturally relevant physical activity curricula.

Conclusion

The 8-week indigenous games program demonstrated statistically significant differences between the experimental and control groups, leading to the rejection of the null hypothesis. The improvements observed in motor skills and attention levels highlight the potential of indigenous games as an effective physical education intervention for university students. These results suggest that integrating indigenous games into structured curricula can promote holistic well-being, enhance motor skill development, and improve cognitive efficiency. The implications of these findings extend beyond physical fitness to include long-term academic performance, mental health, and lifestyle adaptation. This reinforces the importance of traditional games as a sustainable and impactful approach in modern physical education.

Conflict of Interest

No Conflict of Interest among authors

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