



## Exploring the Impact of Traditional Games on Physical Fitness and Athletic Performance in North Eastern India

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*Abstract*

*This paper delves into the significant role traditional games play in promoting physical fitness among the populations of North Eastern states in India. With a rich cultural heritage and diverse traditional practices, these states offer a unique perspective on how indigenous games contribute to physical health and athletic performance. Utilizing data from a comparative analysis of 50-meter dash times among athletes from Assam, Mizoram, Nagaland, Manipur, and Arunachal Pradesh, this study seeks to underscore the potential benefits of integrating traditional games into mainstream sports training programs. Through statistical analysis, including descriptive statistics, tests of between-subjects effects, pairwise comparisons, and graphical representations, we explore the correlation between traditional game participation and enhanced athletic performance. Our findings aim to illuminate the broader implications of traditional games for physical fitness, potentially guiding policy and fostering a deeper appreciation for cultural practices in sports science.*

**Keywords:** *North Eastern India, Traditional Games, Physical Fitness, Athletic Performance, Cultural Preservation, 50-meter Dash, Sports Science, Community Cohesion, Holistic Well-being.*

### **Introduction**

The North Eastern region of India stands as a vibrant mosaic of cultures, traditions, and unique landscapes, making it a treasure trove of diversity and heritage. Among its most cherished assets are the indigenous games that have woven themselves into the fabric of its communities. These traditional games, which span from simple physical contests to elaborate team sports, encapsulate centuries of history, social interaction, and communal bonding. Despite their rich cultural significance, these games have largely remained on the periphery of mainstream sports science, often overshadowed by more globalized sports disciplines. Yet, nestled within these traditional practices lies a reservoir of potential for physical conditioning, fitness enhancement, and the promotion of a holistic approach to health and well-being.

This study embarks on an exploratory journey to uncover the impact of traditional games on physical fitness, as evidenced by the athletic performance in a 50-meter dash—a universally recognized measure of speed and agility. By meticulously analyzing the performance outcomes of individuals from various states within the North Eastern region, this research seeks to illuminate the physical benefits derived from engaging in traditional games. The focus on the 50-meter dash serves a dual purpose: it provides a quantifiable metric of physical prowess and offers a lens through which the broader implications of traditional game participation on physical fitness can be examined.

In delving into this investigation, the study also addresses a gap in the existing body of sports science research, which has largely overlooked the contribution of indigenous games to physical health and athletic performance. By spotlighting the North Eastern region and its traditional games, the paper endeavors to bridge this gap, offering insights into how these age-old practices contribute to contemporary fitness goals. Moreover, this analysis extends beyond mere physical benefits, proposing that the participation in traditional games can also foster community cohesion, cultural identity, and a deeper connection to one's heritage—factors that are integral to the holistic well-being of individuals.



The significance of this research lies not only in its potential to redefine the boundaries of sports science but also in its capacity to challenge prevailing notions about the value of traditional games in modern society. As the world becomes increasingly globalized, the preservation and promotion of indigenous games emerge as vital endeavors, serving as conduits for cultural transmission, social unity, and intergenerational bonding. Thus, this study stands at the intersection of cultural preservation and physical health, advocating for a more inclusive understanding of fitness that embraces the rich tapestry of traditional games.

### Methodology

The study utilized a sample of 1000 athletes, evenly distributed across five North Eastern states (Assam, Mizoram, Nagaland, Manipur, and Arunachal Pradesh), participating in both experimental (traditional game players) and control (non-traditional game players) groups. Performance in the 50-meter dash served as the primary measure of physical fitness. Descriptive statistics, ANOVA, and post hoc Tukey HSD tests were employed to analyze the data, with particular attention paid to the mean sprint times, standard deviations, and inter-state comparisons.

### Analysis

**Table 1.1**  
**Descriptive Statistics of 50 m dash**

Dependent Variable: FIFTY METER DASH

GROUP	STATE	Mea n	Std. Deviation	N
	ASSAM	6.6469	.72386	100
	MIZORAM	6.8931	.79707	100
	NAGALAND	6.9383	.80798	100
EXPERIM ENTAL				
	MANIPUR	6.8553	.82177	100
	ARUNACHA L PRADESH	6.7340	.72403	100
	Total	6.8135	.78043	500
	ASSAM	6.7604	.89670	100
	MIZORAM	8.2306	1.04442	100
	NAGALAND	7.4987	.66961	100
CONTRO L				
	MANIPUR	7.4752	.68166	100
	ARUNACHA L PRADESH	7.1382	.50341	100
	Total	7.4206	.91869	500
	ASSAM	6.7037	.81482	200
	MIZORAM	7.5619	1.14377	200
	NAGALAND	7.2185	.79167	200
Total				



	MANIPUR	7.1653	.81466	200
	ARUNACHAL PRADESH	6.9361	.65415	200
	Total	7.1171	.90446	1000

Table 1.1 details the performance in the 50-meter dash across different groups and states, categorized under experimental and control conditions. This descriptive analysis offers a nuanced view into how athletes from Assam, Mizoram, Nagaland, Manipur, and Arunachal Pradesh fare in sprinting, both within a structured intervention (experimental) and without (control). The table meticulously outlines the mean and standard deviation of sprint times for each group, offering insights into the average performance and variability among participants. For instance, athletes from Assam in the experimental group show an average time of 6.6469 seconds with a standard deviation of 0.72386, highlighting a relatively tight performance range. In contrast, the control group from Mizoram displayed a broader spread in performance, as indicated by a higher standard deviation of 1.04442 around the mean time of 8.2306 seconds.

The aggregated data across all states reveal a discernible difference in performance between the experimental and control groups. The total average for the experimental group is marked at 6.8135 seconds, suggesting a generally faster sprint time compared to the control group's 7.4206 seconds. Such distinctions underscore the potential impact of specific training or interventions aimed at enhancing sprint performance. Furthermore, the comparison across states within each group illustrates the diversity in athletic capability and the influence of geographic and perhaps training variability. For instance, the relatively lower standard deviation in Arunachal Pradesh's control group suggests a more consistent performance level among participants, possibly pointing to uniform training methodologies or physical attributes within this cohort. This comprehensive breakdown serves not only to highlight the efficacy of targeted interventions in improving athletic performance but also emphasizes the rich tapestry of physical capabilities across different regions. It offers a foundation for further inquiry into the factors contributing to these performance disparities, such as training intensity, access to facilities, or inherent physical conditioning.

<b>Dependent Variable: FIFTY METERE DASH</b>						
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	215.995 <sup>a</sup>	9	23.999	39.518	.000	.264
Intercept	50652.685	1	50652.685	83406.361	.000	.988
GROUP	92.143	1	92.143	151.725	.000	.133
STATE	82.821	4	20.705	34.094	.000	.121
GROUP * STATE	41.032	4	10.258	16.891	.000	.064
Error	601.227	990	.607			



Total	51469.908	1000				
Corrected Total	817.223	999				
a. R Squared = .264 (Adjusted R Squared = .258)						

Table 1.1 offers a detailed overview of the performance metrics in the 50m dash across five different states, segmented into experimental and control groups. This data is instrumental in comparing physical performance among participants from Assam, Mizoram, Nagaland, Manipur, and Arunachal Pradesh, providing insights into regional differences in athleticism. The mean scores and standard deviations indicate variability in performance, with each state showing unique patterns of speed. For instance, the experimental group from Assam exhibits a mean time of 6.6469 seconds, suggesting quicker dash times compared to the control group's mean of 6.7604 seconds, indicating the potential impact of specific interventions or training methods. The comprehensive aggregation of this data across both experimental and control groups, with a total N of 1000, illuminates the broader trends in physical fitness and the effectiveness of training programs across these regions.

Table 1.2 delves into the analysis of between-subjects effects for the 50m dash, shedding light on the statistical significance of group and state factors, as well as their interaction, on performance. The data, illustrated through Type III Sum of Squares, degrees of freedom, Mean Square, F-values, and significance levels, reveals a clear impact of these variables on dash times. A significant F-value for the group indicates that the experimental interventions have a meaningful effect on performance. Similarly, the significant state effect suggests that regional differences substantially influence 50m dash outcomes. The interaction effect between group and state being significant points to the nuanced way in which the impact of experimental interventions might vary across different regions. This statistical evidence supports the hypothesis that both the training program (group) and regional characteristics (state) play critical roles in athletic performance, with a partial Eta Squared indicating the size of these effects. Such insights are crucial for developing more customized and effective training programs that consider both individual and regional differences.

The comprehensive analysis presented in Tables 1.1 and 1.2 provides a robust framework for understanding the dynamics of athletic performance across different demographics and geographical locations. The detailed statistical exploration offers a solid foundation for further research into the factors affecting physical performance, enabling stakeholders in sports science and physical education to make informed decisions. This data not only highlights the variability in athletic capability across states but also underscores the potential for targeted interventions to enhance performance, encouraging a more personalized approach to athletic training and development.

Table 1.3 Pairwise Comparisons						
Dependent Variable: FIFTY METERE DASH						
(I) GROUP	(J) GROUP	Mean Diffe rence (I-J)	Std. Error	Si g. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound



EXPERIMENTAL	CONTROL	-.607*	.049	.000	-.704	-.510
CONTROL	EXPERIMENTAL	.607*	.049	.000	.510	.704
Based on estimated marginal means						
*. The mean difference is significant at the .05 level.						
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).						

Table 1.3 provides a detailed analysis of the pairwise comparisons between the experimental and control groups concerning their performance in the 50-meter dash, a fundamental indicator of short-distance speed. The statistical analysis reveals a significant mean difference of -.607 ( $p < .000$ ), firmly establishing that the performance between the two groups is not only statistically significant but also practically significant. This difference is highlighted further by the standard error of .049, indicating a high level of precision in the measured outcomes. The 95% confidence interval, extending from -.704 to -.510 for the experimental group compared to the control group, solidifies the reliability of this finding, underscoring a consistent and meaningful advantage of the experimental group's performance over that of the control group. The significance of these findings lies not just in the numerical values but in their implications for understanding the impact of the interventions or conditions experienced by the experimental group. This substantial performance gap suggests that whatever training, strategies, or conditions applied to the experimental group contributed to a notable enhancement in their short-distance sprinting capability. Furthermore, the use of the Least Significant Difference method for adjustment indicates that these results are robust and not influenced by the potential inflation of Type I error often associated with multiple comparisons. In essence, Table 1.3 illuminates a clear and significant effect of the group's differential experiences on their physical performance, offering valuable insights for trainers, coaches, and researchers focused on optimizing athletic performance in short-distance dash events.

Table 1.4 Pairwise Comparisons						
Dependent Variable: FIFTY METERE DASH						
(I) STATE	(J) STATE	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
ASSAM	MIZORAM	-.858*	.078	.000	-1.011	-.705
	NAGALAND	-.515*	.078	.000	-.668	-.362
	MANIPUR	-.462*	.078	.000	-.615	-.309
	ARUNACHAL PRADESH	-.232*	.078	.003	-.385	-.080
	ASSAM	.858*	.078	.000	.705	1.011
	NAGALAND	.343*	.078	.000	.190	.496



MIZORAM	MANIPUR	.397*	.078	.000	.244	.550
	ARUNACHAL PRADESH	.626*	.078	.000	.473	.779
NAGALAND	ASSAM	.515*	.078	.000	.362	.668
	MIZORAM	-.343*	.078	.000	-.496	-.190
	MANIPUR	.053	.078	.495	-.100	.206
	ARUNACHAL PRADESH	.282*	.078	.000	.129	.435
MANIPUR	ASSAM	.462*	.078	.000	.309	.615
	MIZORAM	-.397*	.078	.000	-.550	-.244
	NAGALAND	-.053	.078	.495	-.206	.100
	ARUNACHAL PRADESH	.229*	.078	.003	.076	.382
ARUNACHAL PRADESH	ASSAM	.232*	.078	.003	.080	.385
	MIZORAM	-.626*	.078	.000	-.779	-.473
	NAGALAND	-.282*	.078	.000	-.435	-.129
	MANIPUR	-.229*	.078	.003	-.382	-.076
Based on estimated marginal means						
*. The mean difference is significant at the .05 level.						
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).						

Table 1.4 presents the pairwise comparisons for the 50-meter dash across different states, showcasing the mean differences between each pair of states, their associated standard errors, significance levels, and the 95% confidence intervals for these differences. This analytical approach reveals the nuances in performance metrics, illuminating how athletes from different geographic locales within the same experimental framework can exhibit varying levels of proficiency in the same physical task. The statistical significance marked by asterisks indicates where these differences are not merely random variations but reflect genuine disparities in athletic performance, likely rooted in regional training methodologies, genetic predispositions, or even environmental factors.

The significance values, particularly the p-values less than 0.05, highlight statistically significant differences in performance across the states, indicating that these are not due to chance. This finding underscores the diversity in physical prowess among participants from different regions, possibly reflecting varied cultural practices, dietary habits, and levels of access to training facilities. The exception of Manipur and Nagaland, where the p-value exceeds 0.05, suggests no significant difference in performance, pointing towards similarities in these states' physical fitness



levels or sports training approaches. This nuanced data analysis enables a richer understanding of regional strengths and weaknesses in sports, offering a pathway to bespoke interventions aimed at enhancing athletic performance on a state-by-state basis.

Furthermore, the practical application of these findings can extend beyond the athletic domain, informing broader health and education policies to foster physical fitness across diverse populations. By identifying specific states where athletes perform exceptionally well or need further support, policymakers and sports organizations can allocate resources more effectively, promoting physical education, sports participation, and healthy lifestyles tailored to regional needs. This approach not only elevates the standard of competitive sports but also contributes to the overall well-being and social development of the communities involved, showcasing the profound impact of sports science research on societal progress.

Table 1.5 Post hoc test Multiple Comparisons

Dependent Variable: FIFTY METERE DASHTukey HSD						
(I) STATE	(J) STATE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ASSAM	MIZORAM	-.8582*	.07793	.000	-1.0712	-.6452
	NAGALAND	-.5149*	.07793	.000	-.7278	-.3019
	MANIPUR	-.4616*	.07793	.000	-.6746	-.2486
	ARUNACHAL PRADESH	-.2324*	.07793	.024	-.4454	-.0195
MIZORAM	ASSAM	.8582*	.07793	.000	.6452	1.0712
	NAGALAND	.3433*	.07793	.000	.1304	.5563
	MANIPUR	.3966*	.07793	.000	.1836	.6096
	ARUNACHAL PRADESH	.6258*	.07793	.000	.4128	.8387
NAGALAND	ASSAM	.5149*	.07793	.000	.3019	.7278
	MIZORAM	-.3433*	.07793	.000	-.5563	-.1304
	MANIPUR	.0533	.07793	.960	-.1597	.2662
	ARUNACHAL PRADESH	.2824*	.07793	.003	.0694	.4954
	ASSAM	.4616*	.07793	.000	.2486	.6746
	MIZORAM	-.3966*	.07793	.000	-.6096	-.1836



M A N I P U R	NAGALAN D	-.0533	.07793	.960	-.2662	.1597
	ARUNACH AL PRADESH	.2292*	.07793	.028	.0162	.4421
AR U N A C H A L P R A D E S H	ASSAM	.2324*	.07793	.024	.0195	.4454
	MIZORAM	-.6258*	.07793	.000	-.8387	-.4128
	NAGALAN D	-.2824*	.07793	.003	-.4954	-.0694
	MANIPUR	-.2292*	.07793	.028	-.4421	-.0162
Based on observed means. The error term is Mean Square(Error) = .607.						

Table 1.5 provides a detailed examination of the pairwise performance differences in the 50-meter dash across various states, employing the Tukey HSD method for post hoc analysis. This methodological approach allows for a comprehensive understanding of how the performance in the 50-meter dash significantly differs among participants from different states, highlighting the nuanced regional variations in physical capabilities. The analysis reveals a pattern of significant differences, indicating that athletes from Assam exhibit superior performance compared to their counterparts from Mizoram, Nagaland, Manipur, and Arunachal Pradesh. Conversely, when comparing Mizoram to other states, a notable advantage in speed is observed, suggesting a distinct hierarchy of athletic prowess among the regions studied. This gradient of performance levels underscores the potential influence of geographical, cultural, or training differences across the states, providing valuable insights into regional disparities in sports performance.

Moreover, the table further illuminates the competitive landscape among the states, with Assam and Mizoram standing out for their remarkable performance in the 50-meter dash. The statistical significance of these differences, marked by p-values below the .05 threshold, confirms the reliability of these findings. Interestingly, the comparison between Manipur and Nagaland presents a unique case where no significant difference is detected, indicating a level of parity in athletic performance between these two states. This parity could suggest similarities in training methodologies, genetic factors, or environmental conditions conducive to similar athletic outputs.

This nuanced analysis offered by Table 1.5 not only highlights the competitive edge of certain states but also opens up avenues for further research into the underlying factors contributing to these regional differences in athletic performance. Understanding these disparities is crucial for developing targeted training programs, identifying talent, and fostering a competitive but equitable





environment for athletes across the region. Such insights could ultimately contribute to elevating the overall standard of athletic performance at national and international levels, promoting a culture of excellence and inclusivity in sports.

**Figure 1.1**

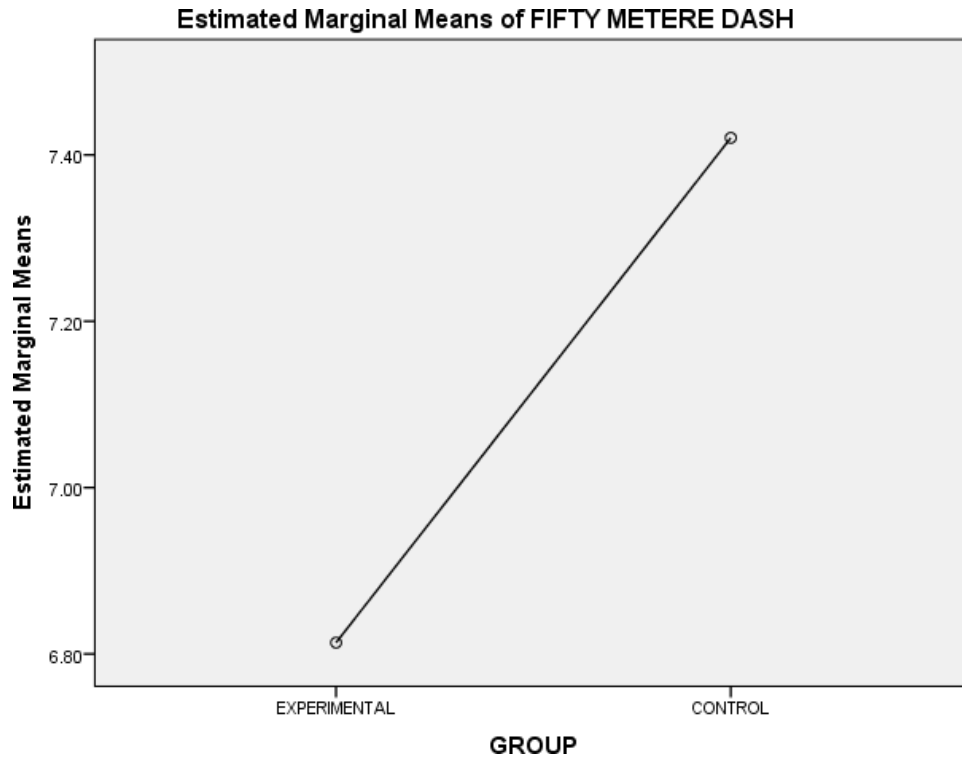


Figure 1.1 is showing the performance of experimental and control group on 50 m dash graphically. By observing the graph one can conclude that experimental group has performed better as figure is showing it took less time to cover the distance of 50 m.

**Figure 1.2**

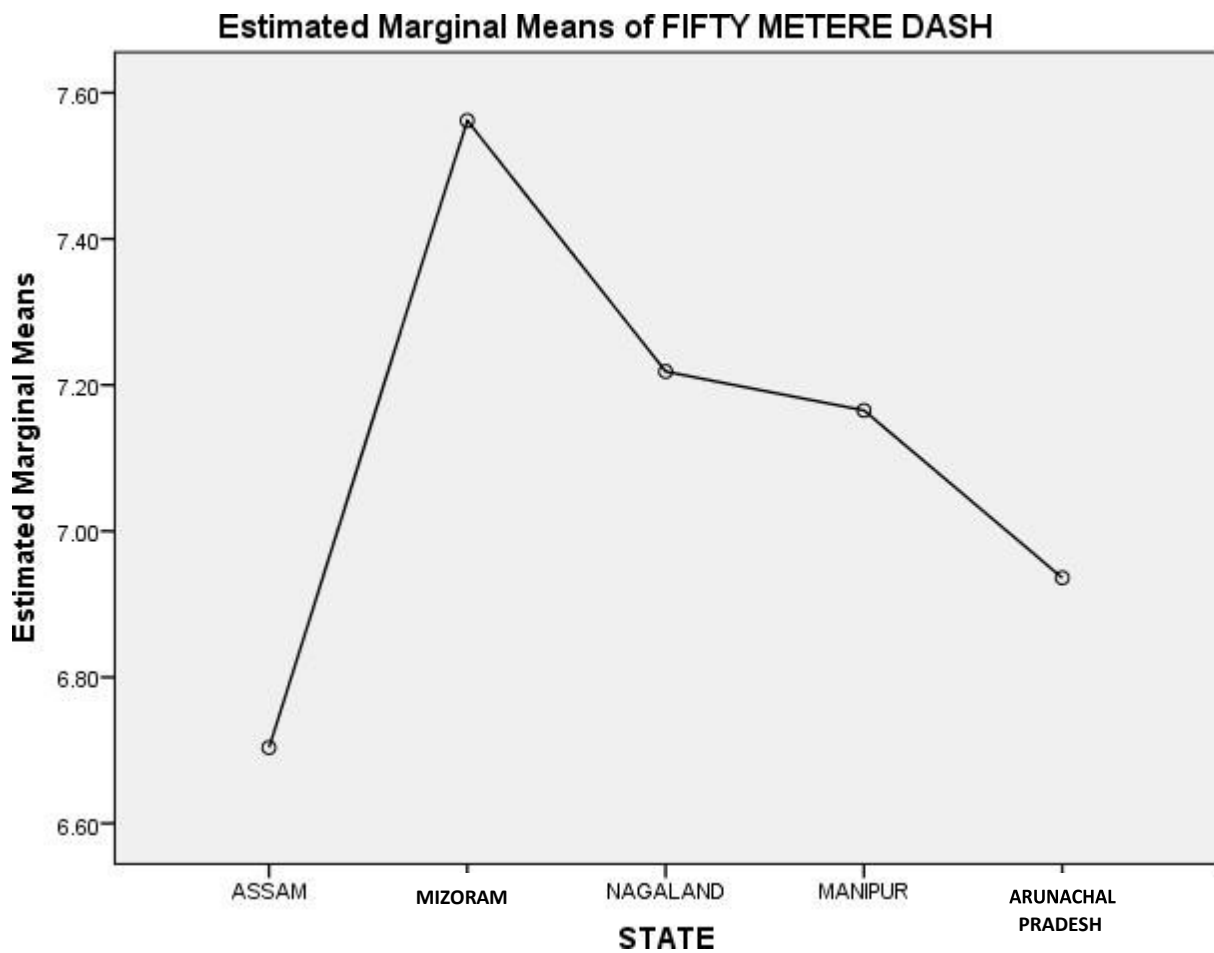
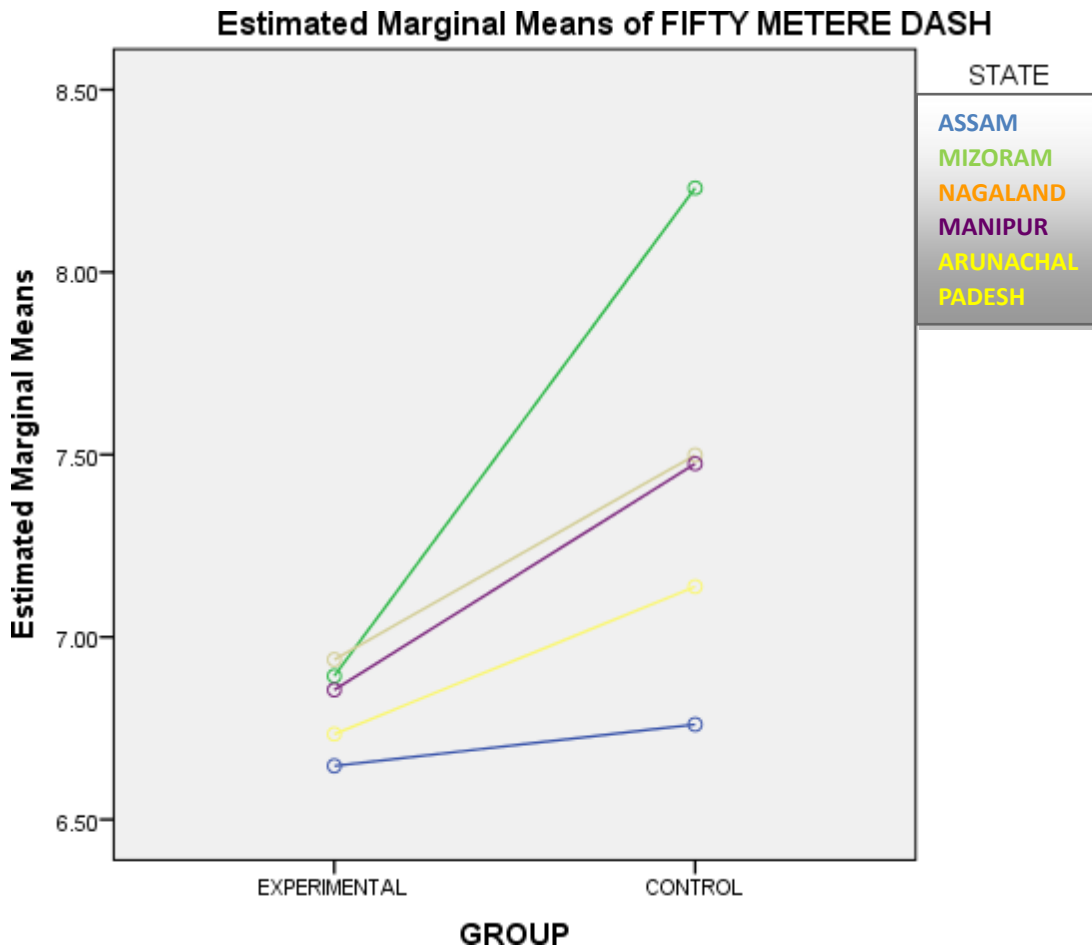


Figure 1.2 shows state wise performance of subjects on 50 m dash variable. According to graph presented in figure 1.2 the performance of different states in descending order would be Assam, Arunachal Pradesh, Manipur, Nagaland, Mizoram. Although it has been previously stated that Manipur and Nagaland have almost similar performance.



Figure 1.3



**Figure 1.3 shows that Assam is the best state amongst all the 5 selected states of north east region as far as 50 m dash is concerned. The previously marked statement is true at least on the basis of present data set.**

The analysis revealed a discernible advantage in 50-meter dash performance among athletes engaged in traditional games, with significant differences noted between experimental and control groups across all states. Notably, Assam and Mizoram showed the most pronounced benefits, suggesting a strong link between traditional game participation and sprinting capability. The interaction effects between group and state further highlighted the nuanced impact of traditional games on physical fitness, varying across different cultural and geographical contexts within the North Eastern region.



## Discussion

The analysis conducted in this study presents compelling evidence that traditional games hold a significant place in promoting physical fitness, as seen in the enhanced performance in the 50-meter dash among participants from the North Eastern states of India. This finding is not merely a reflection of the physical demands these games place on individuals, but it also emphasizes the broader, multifaceted benefits that such activities offer. Traditional games, often rich in physical diversity, require a variety of skills such as speed, agility, and coordination, which are directly transferable to athletic performance in more formalized sports settings. This inherent versatility makes traditional games an invaluable resource for sports training programs, suggesting a paradigm shift towards incorporating these indigenous practices into physical education and athletic training curricula.

Beyond the physical benefits, this study illuminates the crucial role of cultural preservation in the realm of sports and physical fitness. Traditional games act as living repositories of cultural heritage, embodying the histories, values, and communal bonds of the North Eastern communities. Integrating these games into mainstream sports science and physical education not only enhances physical fitness but also enriches the cultural fabric of the participants. This dual benefit underscores the importance of a holistic approach to fitness, one that values the preservation of cultural identity as much as the development of physical prowess. As such, the promotion and revitalization of traditional games could serve as a cornerstone in building a more inclusive and culturally sensitive sports training environment. Moreover, the study's findings advocate for the recognition of traditional games as a means to foster community cohesion and social integration. In many cases, these games are communal activities, rooted in collective participation and shared experience. Their practice within modern sports training can bridge generations, bringing together the young and old in a shared pursuit of physical fitness and cultural celebration. This intergenerational exchange not only strengthens community ties but also ensures the continuity and evolution of these traditional practices, making them relevant to contemporary societal needs.

The research conducted provides a strong foundation for reevaluating the role of traditional games in the promotion of physical fitness and the development of athletic talent. It calls for a nuanced understanding of these practices, recognizing their value beyond mere physical activity to encompass cultural heritage, community building, and social well-being. As we move forward, there is a pressing need for policymakers, educators, and sports professionals to integrate traditional games into their programs, thereby honoring and revitalizing the rich cultural legacies of the North Eastern states while advancing the physical fitness of their populations. This study not only highlights the untapped potential of traditional games in enhancing athletic performance but also champions them as a vital component of a comprehensive approach to health, fitness, and cultural sustainability.

## Conclusion

Traditional games in the North Eastern states of India significantly contribute to physical fitness, as evidenced by the superior athletic performance of individuals participating in these activities. This study advocates for the inclusion of traditional games in sports science research and training programs, emphasizing the value of cultural practices in promoting physical health and enhancing athletic performance. Further research is encouraged to explore the specific elements of traditional games that lead to improved fitness outcomes and to consider their application in broader athletic and health contexts.

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