Comparative Evaluation of Physical Fitness Components among Players of Selected Traditional Games of North-East India

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Abstract

The present study aimed to compare selected physical fitness components among players of ten traditional games practiced across five North-Eastern states of India. A total of 450 male participants aged 14–18 years, representing ten traditional games, were selected through purposive sampling (n = 45 per game). Physical fitness was assessed using standardized field tests: 50 m dash (speed), 1000 m run (endurance), 4×10 m shuttle run (agility), standing broad jump (explosive strength), and sit and reach (flexibility). Descriptive statistics and one-way ANOVA were used to analyze inter-game differences. Results revealed no statistically significant differences ($p > 0.05$) among players of different traditional games in any of the physical fitness components. However, mean score variations indicated minor trends suggesting sport-specific influences on selected components. The findings suggest that traditional games, irrespective of type, contribute uniformly toward the holistic development of motor fitness.

Keywords: Traditional games, Physical fitness, North-East India, Comparative analysis, ANOVA

1. Introduction

Traditional games form a vital part of India's cultural and physical heritage, embodying physical vigor, social interaction, and regional identity. In the North-Eastern states, indigenous games such as *Dhopkhel* of Assam, *Thang-Ta* of Manipur, and *Aki Kiti* of Nagaland not only serve as recreational pastimes but also contribute to the physical conditioning of participants.

Physical fitness encompasses multidimensional attributes including speed, strength, endurance, flexibility, and agility—components that are influenced by habitual physical activities. Traditional games, despite lacking structured training systems, inherently involve dynamic movements, reflexive actions, and endurance-based efforts.

While numerous studies have assessed the physiological and psychological benefits of traditional games (Singh, 2022; Lhouvum & Kumar, 2023), limited comparative evidence exists across multiple North-Eastern states. Hence, this study aimed to evaluate and compare physical fitness components among players of selected traditional games from Assam, Manipur, Mizoram, Nagaland, and Arunachal Pradesh.

Furthermore, the North-Eastern region of India presents a unique cultural diversity where indigenous games are deeply intertwined with community identity, festivals, and traditional values. These games often include elements of wrestling, chasing, throwing, jumping, and

endurance running—closely mirroring the physical demands of modern sports disciplines. Despite their potential as natural means of fitness enhancement, many of these traditional forms of physical activity remain under-researched and are gradually fading in the face of urbanization and the dominance of organized sports.

By scientifically analyzing the performance of traditional game players across different components of physical fitness, the study attempts to bridge a significant gap in sports science literature. It also seeks to highlight the relevance of indigenous movement practices as sustainable, culturally rooted alternatives to conventional training methods. The findings are expected to provide valuable insights into how traditional games can be utilized as effective tools for promoting physical fitness, preserving cultural heritage, and inspiring community-based physical education initiatives in the region.

2. Methodology

2.1 Participants

The study included 450 male traditional game players aged 14–18 years, representing ten traditional games (45 players per game) from five North-Eastern states. The list of games and their associated states is shown in **Table 1**.

Table 1: List of Traditional Games Considered for the Present Study

SL NO.	TRADITIONAL GAME	STATE
1.	Dhopkhel	Assam
2.	Khomlainai	Assam
3.	Thang – ta	Manipur
4.	Sarit – Sarak -	Manipur
5.	Dapo Nyarka Sunam	Arunachal Pradesh
6.	Porok–Pamin Sinam	Arunachal Pradesh
7.	Inbuan	Mizoram
8.	Mizo Inchai	Mizoram
9.	Naga kene	Nagaland
10.	Aki kiti	Nagaland

2.2 Sampling Technique

A purposive sampling method was adopted to ensure representation of regionally significant traditional games. All participants had a minimum of one year of experience in their respective games and no reported injury during testing.

2.3 Variables and Tests Used

Five physical fitness components were selected and assessed using standardized field tests (as per AAHPERD protocol):

Table 1:List of Traditional Games Considered for the Study

VARIABLES	TEST USED
SPEED	50 m DASH
AGILITY	4 X 10M SHUTTLE RUN

CARDIOVASCULAR ENDURANCE	1000 M RUN/WALK
EXPLOSIVE STRENGTH	STANDING BROAD JUMP
FLEXIBILITY	SIT AND REACH TEST

2.4   **Procedure**

Testing was conducted under uniform field conditions across all states. Participants were given adequate warm-up and rest periods between trials. The best performance out of two attempts was recorded for analysis.

2.5 Statistical Analysis

Descriptive statistics (mean and standard deviation) and one-way Analysis of Variance (ANOVA) were applied to compare mean differences among players of ten traditional games for each fitness variable. Statistical significance was set at $p < 0.05$. All analyses were conducted using SPSS (version 25.0).

3. Results

3.1 Descriptive Statistics

The descriptive statistics for each of the five physical fitness components across the ten traditional games are presented in **Table 2**.

Table 2: Descriptive Statistics of Physical Fitness Tests Across Different Traditional Game Players.

Traditional Game	50 m Dash (sec)	1000 m Run (sec)	4×10 m Shuttle Run (sec)	Standing Broad Jump (cm)	Sit & Reach (cm)
Dhopkhel	M = 7.35 ± 0.45	M = 384.12 ± 66.79	M = 10.65 ± 0.73	M = 223.05 ± 16.90	M = 33.09 ± 6.55
Khomlainai	M = 7.35 ± 0.57	M = 393.88 ± 58.31	M = 10.44 ± 0.69	M = 223.87 ± 14.53	M = 31.90 ± 5.62
Thang–ta	M = 7.49 ± 0.45	M = 389.52 ± 76.85	M = 10.69 ± 0.70	M = 228.77 ± 17.72	M = 31.95 ± 5.88
Sarit–Sarak	M = 7.42 ± 0.40	M = 389.54 ± 66.89	M = 10.69 ± 0.71	M = 221.11 ± 21.25	M = 31.88 ± 4.93
Dapo Nyarka Sunam	M = 7.43 ± 0.55	M = 391.57 ± 65.41	M = 10.40 ± 0.68	M = 219.88 ± 20.13	M = 32.04 ± 5.41
Porok–Pamin Sinam	M = 7.44 ± 0.41	M = 396.14 ± 58.61	M = 10.69 ± 0.72	M = 225.83 ± 19.68	M = 31.78 ± 5.82
Inbuan	M = 7.38 ± 0.53	M = 399.21 ± 64.64	M = 10.65 ± 0.65	M = 216.78 ± 20.05	M = 32.12 ± 7.10
Mizo Inchai	M = 7.53 ± 0.46	M = 390.12 ± 77.77	M = 10.71 ± 0.69	M = 223.54 ± 16.57	M = 29.34 ± 7.01
Naga Kene	M = 7.43 ± 0.48	M = 397.33 ± 52.01	M = 10.61 ± 0.76	M = 227.31 ± 15.77	M = 31.71 ± 6.34

Aki Kiti	M = 7.43 ± 0.46	M = 401.16 ± 65.54	M = 10.55 ± 0.71	M = 225.83 ± 14.53	M = 31.85 ± 5.91

Table 2 presents the descriptive statistics for the performance of players of ten traditional games from the North Eastern States of India across five selected physical fitness components — speed (50 m Dash), endurance (1000 m Run), agility (4×10 m Shuttle Run), explosive strength (Standing Broad Jump), and flexibility (Sit and Reach).

The mean values indicated comparable levels of performance across the different traditional games, suggesting that players from all games possessed relatively similar physical fitness profiles. Minor variations were observed in the mean scores: for instance, Thang–ta and Naga Kene players recorded slightly higher mean values in explosive strength, while Dhopkhel and Inbuan players showed marginally better results in sprint performance. However, the standard deviations reflected some within-group variability, which is expected given the diverse movement patterns and physical demands associated with each game.

Overall, the descriptive results suggest that participation in different traditional games may lead to broadly similar levels of general physical fitness, though specific components may differ marginally according to the nature of the activity.

3.2 ANOVA Results

One-way ANOVA was conducted to compare performance across the ten traditional game groups for five motor fitness components. The results of the one-way ANOVA are summarized in **Table 3.**

Table 3: Summary of One-Way ANOVA Results for Five Physical Fitness Variables (10 games, N=450)

Variable	df (Between, Within)	F	p	Partial η²
50 m Dash (sec)	(9, 440)	0.643	0.760	0.013
1000 m Run (sec)	(9, 440)	0.286	0.978	0.006
4×10 m Shuttle Run (sec)	(9, 440)	1.061	0.391	0.021
Standing Broad Jump (cm)	(9, 440)	1.839	0.059	0.036
Sit & Reach (cm)	(9, 440)	1.064	0.388	0.021

Table 3 presents the summary ANOVA results. No statistically significant differences were found among the game groups for 50 m Dash ($F(9,440) = 0.643$, $p = .760$, partial $\eta^2 = .013$), 1000 m Run ($F(9,440) = 0.286$, $p = .978$, partial $\eta^2 = .006$), 4×10 m Shuttle Run ($F(9,440) = 1.061$, $p = .391$, partial $\eta^2 = .021$), Standing Broad Jump ($F(9,440) = 1.839$, $p = .059$, partial $\eta^2 = .036$), and Sit & Reach ($F(9,440) = 1.064$, $p = .388$, partial $\eta^2 = .021$).
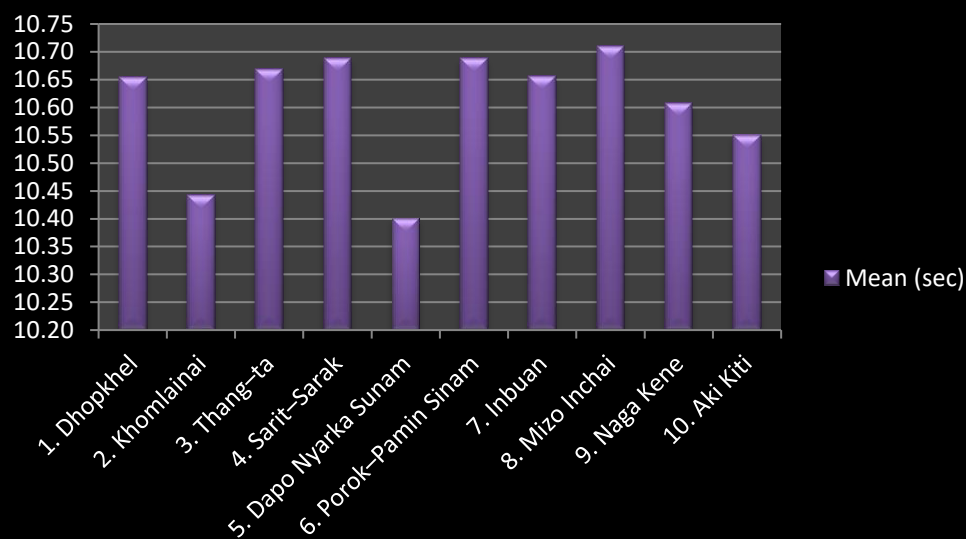
3.3 Graphical Representation

Figures 1–5 illustrate the average performance trends across games for each physical fitness component:
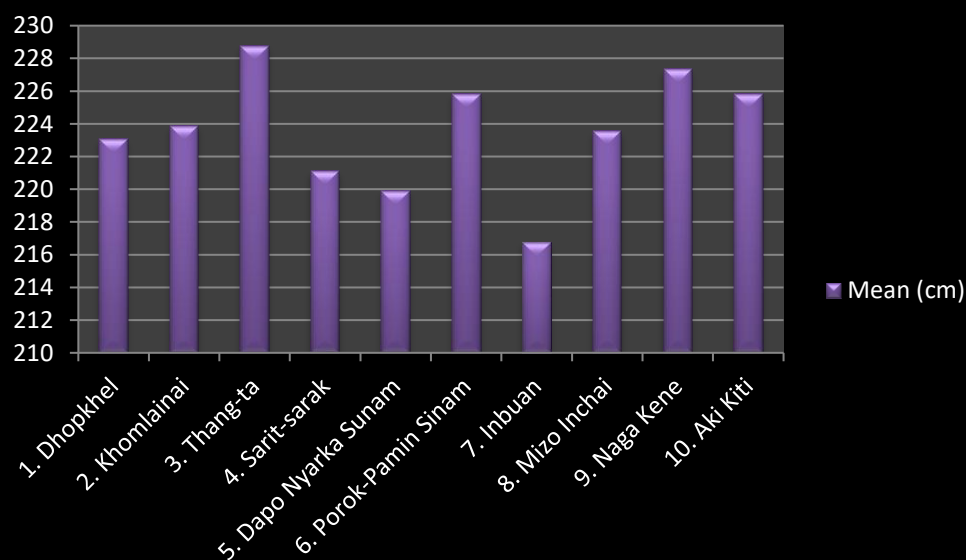
Figure 1(a-e): Average Performance of Players of Different Traditional Games on five Selected Physical Fitness Tests.
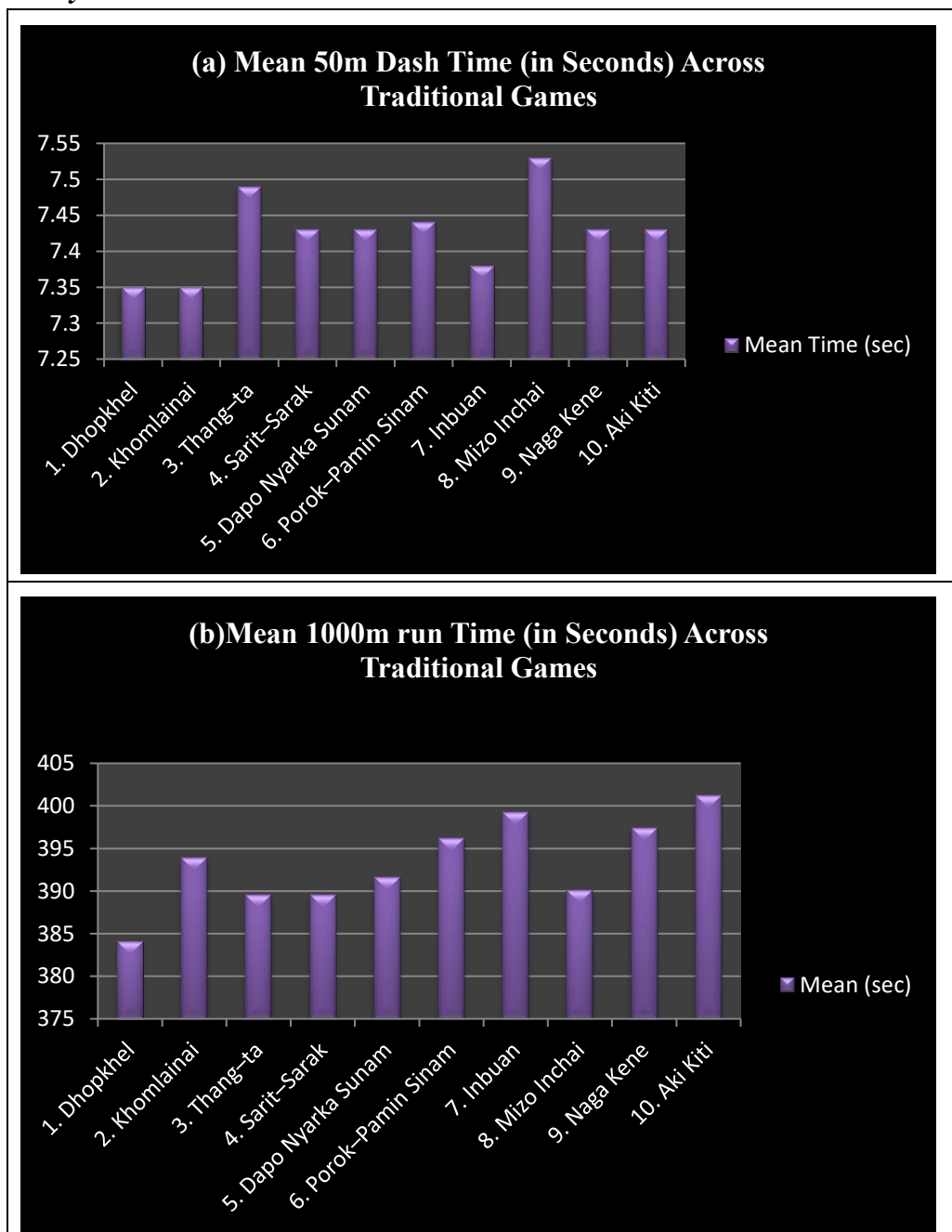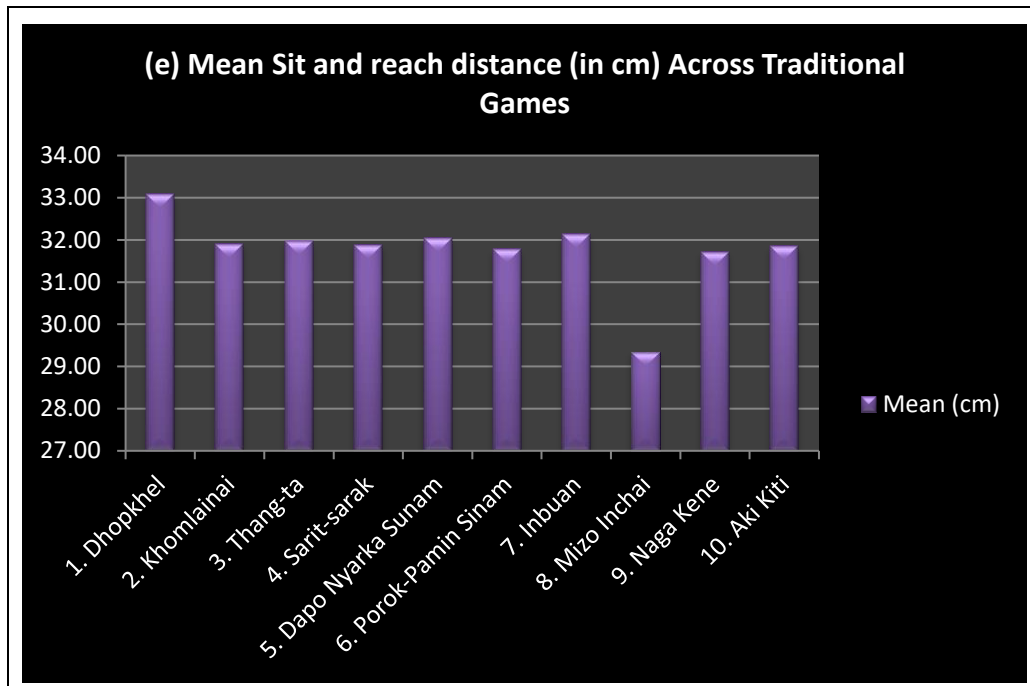
Mean 4 x 10m Shuttle run Time (in Seconds) Across Traditional Games

(d) Mean Standing broad jump distance (in cm) Across Traditional Games

(e) Mean Sit and reach distance (in cm) Across Traditional Games

As shown in **Figure 1(a-e),** the mean performance of players across the ten traditional games followed a generally similar pattern in all fitness components. Thang–ta and Naga Kene players recorded marginally higher mean values in explosive strength, while Dhopkhel and Inbuan players demonstrated slightly better sprint times. However, these differences did not reach statistical significance ($p > .05$).

4. Discussion

The present study aimed to compare selected physical fitness components among players of ten traditional games from five North Eastern states of India. The components assessed included speed, endurance, agility, explosive strength, and flexibility. Although the Analysis of Variance (ANOVA) revealed no statistically significant differences among the players of different games ($p > 0.05$) for any of the five test items, several directional trends were observed in the descriptive results.

Players of Thang–ta and Naga Kene displayed slightly higher mean values in the Standing Broad Jump test, indicating relatively greater lower-body explosive strength, possibly due to the combat and dynamic movement patterns inherent in these games. Similarly, Dhopkhel and Inbuan players demonstrated marginally better 50 m Dash performance, reflecting enhanced sprinting ability derived from short, intense bursts of activity typical of these traditional games. Flexibility scores were more uniform across groups, though Dhopkhel players exhibited slightly higher mean reach values, perhaps due to their extensive range of motion during gameplay.

The overall findings suggest that participation in different traditional games contributes to the development of general physical fitness but does not lead to pronounced specialization in specific components. This may be attributed to the fact that traditional games in the region

often involve a mix of running, jumping, and body control movements, leading to balanced conditioning across multiple fitness domains.

These results align with earlier research emphasizing the positive impact of indigenous physical activities on holistic fitness and functional ability (Kumar & Morya, 2023; Singh et al., 2020). The minimal inter-group variation found in this study underscores the shared physical demands embedded in traditional games, regardless of regional or cultural differences. The findings also indicate that traditional games, though diverse in structure and origin, promote a similar spectrum of motor and physiological adaptations.

5. Conclusion

The study concludes that players participating in various traditional games of the North Eastern states exhibit comparable levels of physical fitness across the components of speed, endurance, agility, explosive strength, and flexibility. While no statistically significant differences were observed among the ten games, minor trends suggest that the movement characteristics of each game may influence specific components to a limited extent.

These findings reinforce the significance of traditional games as valuable community-based physical activities that contribute to maintaining and enhancing physical fitness. Integrating such games into physical education and sports programs can serve as a culturally relevant means of promoting active lifestyles, particularly among youth. Future research may extend this work by including female participants, larger sample sizes, and biomechanical or physiological measurements to explore deeper variations among different games.

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