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Association of Physical Fitness Components with Motor Fitness among Urban and Rural Handball Players of Jharkhand

AMIT KUMAR SINGH, RAMESH KUMAR

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Abstract

The purpose of this study was to examine the association between physical fitness components and motor fitness among urban and rural handball players of Jharkhand. A total of 90 male players (45 urban and 45 rural), aged 18–25 years, were selected using purposive sampling. Physical fitness variables included cardiovascular endurance, explosive strength, and muscular endurance, while motor fitness variables included agility, balance, speed, and flexibility. Standardized and widely accepted tests were used for data collection.

Pearson's product moment correlation revealed a significant negative relationship between explosive strength and agility ($r = -0.287$, $p < 0.01$), balance ($r = -0.244$, $p < 0.05$), and speed ($r = -0.227$, $p < 0.05$). Since agility and speed are measured in time, this negative relationship indicates improved motor performance with increased explosive strength. The independent samples t-test showed significant differences between urban and rural players in explosive strength, agility, balance, speed, and cardiovascular endurance ($p < 0.05$), whereas no significant differences were found in muscular endurance and flexibility ($p > 0.05$).

It is concluded that explosive strength significantly influences motor fitness performance, and differences exist between urban and rural handball players.

Keywords

Physical fitness, motor fitness, handball players, explosive strength, cardiovascular endurance, rural athletes, urban athletes.

Introduction

Physical fitness is an essential component for successful performance in sports and games. It refers to the ability of an individual to perform daily activities with vigor and alertness without undue fatigue and with enough energy to enjoy leisure-time activities. In competitive sports such as handball, physical fitness plays a crucial role in enhancing performance and preventing injuries. According to David K. Mathews (1980), physical fitness includes various components such as strength, endurance, speed, flexibility, and coordination which contribute significantly to sports performance.

Handball is a fast-paced team sport that requires a high level of physical and motor fitness. Players must possess well-developed physical abilities such as cardiovascular endurance, muscular strength, and muscular endurance in order to maintain performance throughout the match. In addition, motor fitness components like agility, balance, speed, and flexibility are essential for executing quick movements, maintaining body control, and responding rapidly to game situations. Donald K. Mathews emphasized that proper evaluation of these fitness components is necessary for improving athletic performance and designing effective training programs.

Motor fitness refers to the ability to perform movements efficiently and accurately. It includes qualities such as agility, balance, coordination, speed, and flexibility which are essential for successful participation in sports. According to Hardeep Singh (1991), motor fitness plays an important role in determining the skill level and overall performance of athletes. Athletes with better motor fitness can perform complex movements more efficiently and maintain better control during sports activities.

Explosive strength is another important physical component required in handball, as the sport involves jumping, throwing, and rapid movements. Similarly, cardiovascular endurance allows players to sustain high-intensity activity for longer durations during the game. Tudor Bompa (1999) stated that the development of strength and endurance significantly contributes to athletic performance in team sports. Proper training and conditioning programs help athletes improve these physical abilities.

Environmental factors also influence the development of physical and motor fitness. Athletes from urban regions often have better access to training facilities, coaching, and sports infrastructure compared to those from rural areas. On the other hand, rural athletes may develop physical strength and endurance through daily physical activities and natural environments. According to Harrison Clarke and David Clarke (1987), differences in training environment and lifestyle can lead to variations in physical fitness levels among athletes.

Despite the importance of physical and motor fitness in handball performance, limited research has been conducted to examine the relationship between these components among handball players, particularly in the context of urban and rural regions of Jharkhand. Therefore, the present study aims to investigate the association of physical fitness components with motor fitness among handball players of urban and rural regions of Jharkhand.

Methodology

Selection of Subjects

The subjects for this study consisted of 90 male handball players from Jharkhand. Among them, 45 players belonged to urban regions and 45 players belonged to rural regions. The players were selected using the purposive sampling technique. All participants were within the age group of 18–25 years and had prior experience in competitive handball. The selected players had represented their teams at national, state, and district level competitions.

Selection of Variables

The following variables were selected for the study.

Physical Fitness Variables

1. Cardiovascular Endurance
2. Explosive Strength
3. Muscular Endurance

Motor Fitness Variables

1. Agility
2. Balance
3. Speed
4. Flexibility

Criterion Measures

Variable	**Test Used**
Cardiovascular Endurance	600 Yard Run
Explosive Strength	Standing Broad Jump
Muscular Endurance	Sit-ups Test
Agility	Shuttle Run
Balance	Flamingo Balance Test
Speed	50 Meter Dash
Flexibility	Sit and Reach Test

Statistical Techniques

The collected data were analysed using appropriate statistical techniques. Descriptive statistics such as mean and standard deviation were used to describe the variables. Pearson product moment correlation was applied to determine the relationship between physical fitness and motor performance variables, while the independent sample t-test was used to compare urban and rural handball players with respect to selected physical fitness and motor performance variables.

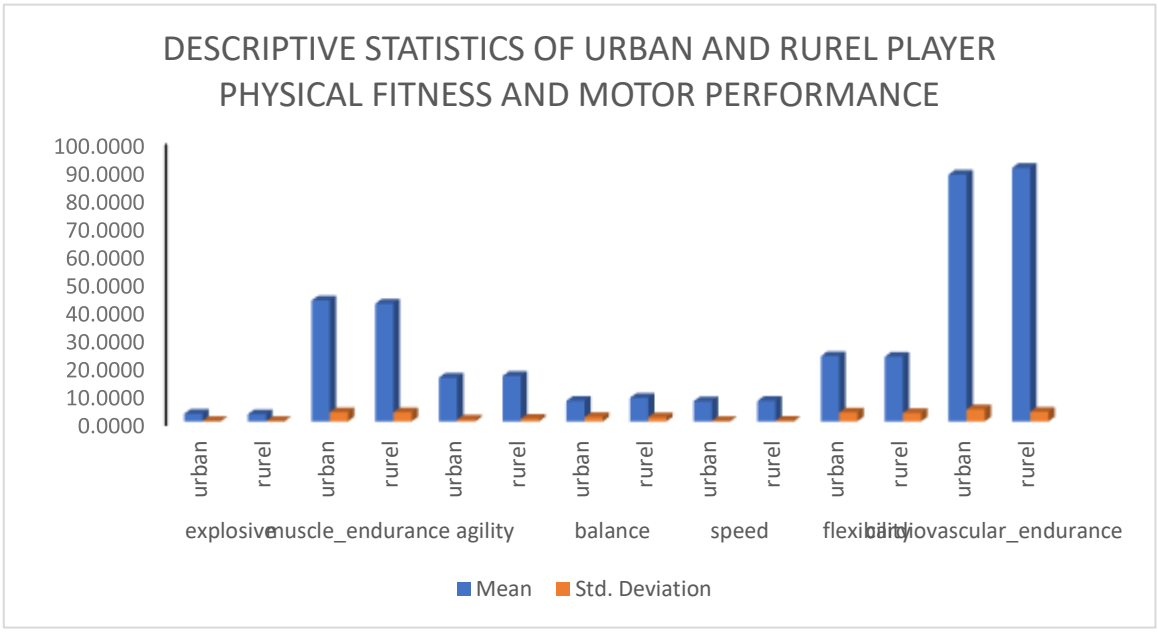
TABLE 1: Descriptive Statistics of Selected Physical Fitness and Motor Performance Variables

Variables		Mean	Std. Deviation
Explosive Strength	urban	2.68	0.17
	rural	2.57	0.12
Cardiovascular Endurance	urban	88.05	4.31
	rural	90.49	3.44
Muscular endurance	urban	43.15	3.28
	rural	42.06	3.22

Agility	urban	15.59	0.67
	rural	16.20	0.91
Balance	urban	7.31	1.53
	rural	8.40	1.49
Speed	urban	7.17	0.18
	rural	7.33	0.19
Flexibility	urban	23.30	3.19
	rural	23.05	3.01

Table 2: Pearson Correlation between Physical Fitness and Motor Performance Variables

Variables	Explosive	Muscular Endurance	Agility	Balance	Speed	Flexibility	Cardiovascular Endurance
Explosive Strength	1	.016	-.287**	-.244*	-.227*	-.105	-.116
Cardiovascular Endurance	-.116	-.041	.067	.099	.185	-.091	1
Muscular Endurance	.016	1	.071	-.166	-.137	-.085	-.041
Agility	-.287**	.071	1	.059	.174	-.007	.067
Balance	-.244*	-.166	.059	1	-.007	.043	.099
Speed	-.227*	-.137	.174	-.007	1	.038	.185
Flexibility	-.105	-.085	-.007	.043	.038	1	-.091



Results and Discussion

The data were analysed using Pearson's product moment correlation and independent samples t-test. The correlation analysis revealed a significant negative relationship between explosive strength and agility ($r = -0.287$, $p < 0.01$), balance ($r = -0.244$, $p < 0.05$), and speed ($r = -0.227$, $p < 0.05$). This indicates an inverse relationship, suggesting that as explosive strength increases, the time taken to perform agility and speed tasks decreases, thereby improving motor performance. No significant relationships were observed between other physical fitness and motor fitness variables ($p > 0.05$).

The independent samples t-test showed significant differences between urban and rural handball players in explosive strength, agility, balance, speed, and cardiovascular endurance ($p < 0.05$). However, no significant differences were found in muscular endurance and flexibility ($p > 0.05$).

These findings suggest that explosive strength plays an important role in motor performance, and differences exist between urban and rural players, possibly due to variations in training and environmental factors.

Conclusion

Based on the findings of the present study, it is concluded that physical fitness components are significantly associated with motor fitness among handball players. Explosive strength showed a significant inverse relationship with agility, balance, and speed, indicating its important role in enhancing motor performance.

Significant differences were observed between urban and rural players in explosive strength, agility, balance, speed, and cardiovascular endurance ($p < 0.05$), whereas no significant differences were found in muscular endurance and flexibility ($p > 0.05$).

Therefore, it may be concluded that the development of explosive strength is essential for improving motor fitness performance, and training programs should be designed accordingly to enhance performance among handball players.

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