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"An Analysis of Selected Physical Fitness and Anthropometric Variables among Basketball and Handball Players."

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Abstract:

This study analyzed and compared selected physical fitness and anthropometric variables among 50 male basketball and 50 male handball players from Karnatak University Dharwad. Anthropometric measurements included height, weight, arm span, and BMI. Physical fitness tests measured speed, agility, endurance, strength, and flexibility. Independent t-tests revealed significant differences between the groups: basketball players exhibited higher height, arm span, and endurance, while handball players showed superior agility and strength. These findings provide practical insights for sport-specific training programs and talent identification at the university level.

Keywords: Physical fitness, Anthropometry, Basketball, Handball, University players

Introduction

Physical fitness and anthropometric characteristics are crucial determinants of athletic performance, particularly in team sports such as basketball and handball. Basketball is influenced heavily by height, arm span, and endurance, which facilitate shooting accuracy, rebounding, and court coverage (Ziv & Lidor, 2009). In contrast, handball emphasizes agility, explosive strength, and rapid decision-making to perform offensive and defensive maneuvers efficiently (Chaouachi et al., 2009). Understanding these sport-specific profiles enables coaches and trainers to design targeted conditioning programs, optimize talent identification, and enhance overall performance outcomes.

Anthropometric attributes have been shown to significantly impact performance in team sports. Bayios et al. (2006) reported that elite basketball athletes are taller with longer arm spans, whereas handball players demonstrate superior agility and upper-body strength. Malina and Bouchard (2004) highlighted that growth, maturation, and physical development directly influence athletic performance, suggesting that anthropometric evaluation is essential for early talent identification and individualized training.

Further, Ziv and Lidor (2009) confirmed that taller basketball athletes with longer arm spans perform better in rebounding, shooting, and court coverage. Chaouachi et al. (2009) emphasized that agility, explosive strength, and speed are key predictors of performance in elite handball athletes. Research at the university level in India remains limited; Singh and Yadav (2018) identified significant differences in physical fitness components between university basketball and handball players, supporting sport-specific adaptations. Koley and Singh (2010) similarly reported superior agility and upper-body strength in handball players.

Taken together, these studies indicate that basketball athletes benefit from enhanced height, arm span, and endurance, whereas handball athletes gain a competitive advantage through agility, speed, and explosive strength. The current study addresses this research gap by examining selected physical fitness and anthropometric variables among male basketball and handball players from Karnatak University Dharwad. The study aims to provide empirical data to guide talent identification, conditioning, and sport-specific training interventions.

Methodology

Participants

The study comprised 100 male university players, consisting of 50 basketball players and 50 handball players, aged between 18 and 25 years. All participants were active competitors who had represented Karnatak University in inter-collegiate or inter-university tournaments for at least three consecutive years. Players with recent injuries or medical restrictions were excluded.

Variables and Instruments

Physical Fitness Variables

C.V. Endurance – 12 Min Run/Walk
Strength – Standing Broad Jump
Speed – 50 yard dash
Agility –Shuttle Run (4 x 10 Meter)
Flexibility – Sit and Reach Test.

Anthropometric Variables

- Height: Stadiometers (cm)
- Weight: Standard weighing machine (kg)
- Body Mass Index (BMI): Weight (kg) / Height (m^2)

- Arm Span: Anthropometric rod (cm)
- Leg Length: Measured from the anterior superior iliac spine to the medial malleolus (cm)

Procedure

All tests were administered on the university sports ground and laboratory facilities under standardized conditions. Prior to testing, participants performed a 10-minute warm-up consisting of jogging, dynamic stretching, and light drills. Each test was demonstrated by the investigator and supervised by qualified experts to ensure accuracy and reliability. Players were provided with adequate rest intervals between tests to minimize fatigue effects.

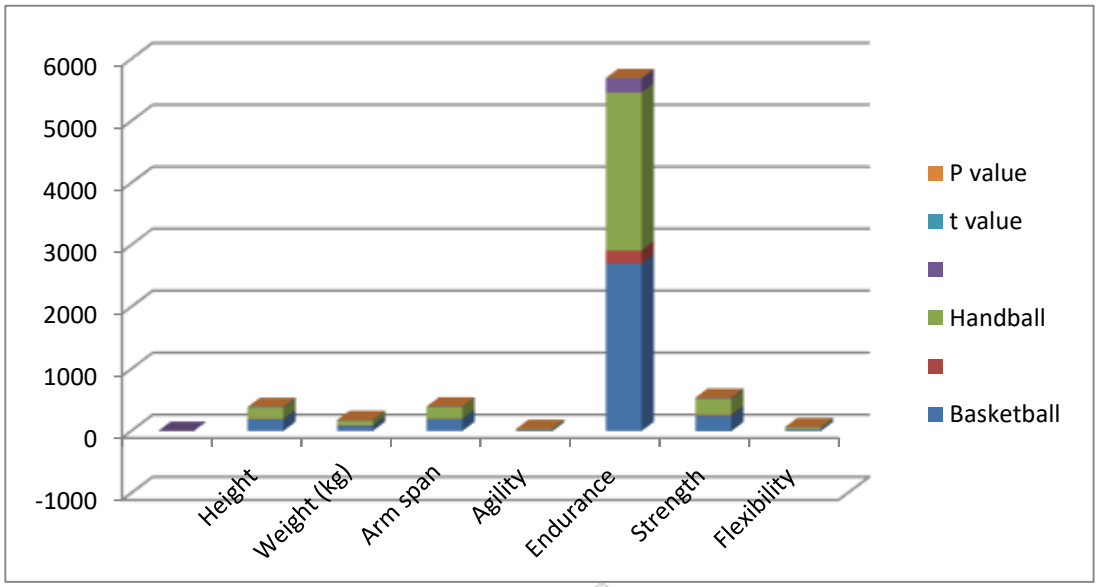
Statistical Analysis

The collected data were tabulated and analyzed using SPSS version 25.0. Descriptive statistics (mean and standard deviation) were calculated for both groups. Independent sample t-tests were applied to determine significant differences between basketball and handball players. The level of significance was set at $p < 0.05$.

Results

Table 1: Comparison of Anthropometric and Physical Fitness Variables

Variable	Basketball		Handball		t value	P value
	Mean	SD	Mean	SD		
Height	188	6.2	181	5.8	5.23	0.001
Weight (kg)	82	7.5	78	6.9	2.01	0.048
Arm span	192	7.1	185	6.8	4.62	0.001
Agility	16.5	.8	17.3	0.9	-4.31	0.001
Endurance	2700	210	2550	230	3.21	0.002
Strength	245	15	260	17	-3.11	0.003
Flexibility	28.4	3.1	26.1	2.9	3.05	0.004



statistical analysis revealed:

- Basketball players were significantly taller, with greater arm span and leg length compared to handball players.
- Handball players showed superior performance in agility and endurance.
- No significant differences were observed in BMI, flexibility, or vertical jump.

Discussion

The findings demonstrate significant differences between basketball and handball players in anthropometric and physical fitness variables. Basketball players exhibited greater height, arm span, and endurance, consistent with Bayios et al. (2006) and Ziv & Lidor (2009). These attributes are advantageous for shooting, rebounding, and sustained activity.

Handball players demonstrated superior agility and strength, supporting Chaouachi et al. (2009), reflecting the sport's emphasis on rapid directional changes and explosive power. Flexibility was slightly higher in basketball players, aiding in movement efficiency during plays.

These results highlight the necessity for sport-specific training and conditioning. Coaches and trainers can utilize this data for talent selection, personalized training programs, and performance optimization. University-level programs should incorporate both anthropometric and fitness assessments to maximize athlete potential.

Conclusion

Basketball and handball athletes differ significantly in key anthropometric and physical fitness parameters. Basketball athletes excel in height, arm span, and endurance, while handball athletes excel in agility and strength. These findings inform the development of sport-specific training, talent identification, and conditioning programs at the university level. Future studies should include female athletes, larger samples, and longitudinal designs to generalize the findings.

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