

Impact of Physical Fitness and Psychological Parameters on the Performances of College Volleyball Players

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Abstract—The present study aimed to examine the relationship between physical fitness components, selected psychological parameters, and the performance of college volleyball players. Fifty male college volleyball players aged 18–23 years participated. Physical fitness variables included agility, explosive leg power, muscular endurance, and speed, while psychological variables included achievement motivation, competitive anxiety, and self-confidence. Performance was assessed through match performance ratings by expert coaches. Statistical analysis revealed significant correlations between physical fitness, psychological parameters, and performance outcomes. Regression analysis indicated that both physical and psychological factors jointly predicted performance to a high degree.

Keywords: Physical fitness, Psychological parameters, Volleyball performance, College athletes, Motivation, Anxiety

1. INTRODUCTION:

Volleyball is a high-intensity intermittent sport requiring a combination of physical fitness and psychological preparedness to achieve optimal performance (Sheppard et al., 2008). Physical fitness components such as agility, explosive power, and muscular endurance contribute directly to skill execution and game dynamics (Gabbett & Georgieff, 2007). Similarly, psychological traits like achievement motivation and competitive anxiety play a pivotal role in determining athletes' ability to handle pressure situations and maintain consistency (Cox, 2012).

Previous studies have emphasized the isolated role of either physical or psychological factors on performance; however, a combined examination provides a more holistic understanding (Singh & Sharma, 2018). This study investigates the integrated effect of both dimensions on the competitive performance of college volleyball players.

2. MATERIALS AND METHODS

2.1 Participants:

A total of 50 male college volleyball players (mean age = 20.4 ± 1.5 years) from university-level teams participated. All participants had a minimum of three years of competitive experience.

2.2 Variables and Instruments:

Physical Fitness Variables:

Agility: Illinois Agility Test (R = 0.94 reliability; Getchell, 1979)

Explosive Leg Power: Vertical Jump Test (Bosco et al., 1983)

Muscular Endurance: Push-Up Test (American College of Sports Medicine, 2017)

Speed: 30-m Sprint Test (Haugen et al., 2012)

Psychological Variables:

Achievement Motivation: Sports Achievement Motivation Test (SAMT; Kamlesh, 1990)

Competitive Anxiety: SCAT (Martens et al., 1990)

Self-Confidence: Trait Sport Confidence Inventory (Vealey, 1986)

Performance Rating: Match performance evaluated by three expert coaches using a standardized Volleyball Performance Rating Scale (Srivastava, 2015).

2.3 Data Collection Procedure:

All tests were conducted under standardized conditions over two days. On Day 1, physical fitness tests were administered; on Day 2, psychological assessments and performance evaluations were carried out.

2.4 Statistical Analysis:

Data were analyzed using Pearson's correlation, multiple regression analysis, and descriptive statistics via SPSS 26.0. Significance was set at $p < 0.05$.

3. RESULTS:

Table 1. Descriptive Statistics of Variables

Variable	Mean	SD	Min	Max
Agility (sec)	16.21	0.84	15.01	18.10
Vertical Jump (cm)	54.42	5.32	45.00	65.00
Push-ups (reps)	38.10	6.21	25.00	50.00
Speed (sec)	4.39	0.22	4.05	4.90
Achievement Motivation	27.42	3.14	20.00	33.00
Competitive Anxiety	18.20	4.12	12.00	27.00
Self-Confidence	30.56	3.88	24.00	38.00
Performance Rating (1–10)	7.42	1.12	5.00	9.50

Table 2. Correlation between Physical, Psychological Variables and Performance

Variable	Performance (<i>r</i>)	Sig. (<i>p</i>)
Agility	-0.46	0.002*
Vertical Jump	0.54	0.001*
Push-ups	0.48	0.002*
Speed	-0.39	0.006*
Achievement Motivation	0.51	0.001*
Competitive Anxiety	-0.43	0.004*
Self-Confidence	0.57	0.000*

(*p* < 0.05 indicates significance)

Table 3. Multiple Regression Analysis Predicting Performance

Predictor	β	t	Sig. (<i>p</i>)
Vertical Jump	0.32	3.24	0.002*
Self-Confidence	0.38	3.88	0.000*
Achievement Motivation	0.28	2.97	0.004*
Agility	-0.21	-2.42	0.019*
$R^2 = 0.62$, $F(4,45) = 18.27$, $p = 0.000$			

4. DISCUSSION:

The findings reveal that both physical fitness and psychological parameters significantly influence volleyball performance in college athletes.

Physical Fitness: Vertical jump (explosive power) showed the highest correlation with performance, aligning with Sheppard et al. (2008) who emphasized the importance of jumping ability in spiking and blocking. Agility and speed also contributed significantly, as rapid movement changes are critical in defensive and offensive plays.

Psychological Factors: Self-confidence emerged as the strongest predictor, consistent with Vealey (1986), indicating that confident players perform better under competitive pressure. Achievement motivation also showed a positive association, while competitive anxiety negatively impacted performance, corroborating Martens et al. (1990).

Integrated Model: The regression model explained 62% of variance in performance, highlighting that optimal training programs should integrate physical conditioning with psychological skills training.

5. CONCLUSION:

This study confirms that performance in volleyball is not solely dependent on physical capability but also strongly influenced by psychological readiness. Coaches should incorporate jump training, agility drills, and psychological skill development to optimize player performance.

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