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Comparative Study on Selected Physiological Variables among Different Positional Kanyashree Cup Women Soccer Players

Md. Washim Akhter[1], Dr. Pravin Kumar[2]

[1]PhD Scholar, Desh Bhagat University, Mandi Gobindgarh, Punjab, India

[2]Director of the Dept. of Physical Education, Desh Bhagat University, Mandi Gobindgarh, Punjab, India

Abstract: ***Purpose of the study was to investigate the Comparative e study on selected physiological variables among different positional kanyashree cup women soccer players. For the present study a total subject (N-100) Kanyashree cup women soccer players of West Bengal, age ranging 15-18 years. The researchers selected physiological variables for the present study. The data was analyzed by applying F-test at 0.05 level of significance. The finding of the present study strongly reveals that in-between two parameters peak expiratory flow rate and vo$_2$ max have significant changes on physiological variables of women soccer players in different position.***

Keywords: physiologicalvariables, different football position, kanyashree cup, peak expiratory flow rate, vo$_2$ max.

1. Introduction

Physiological abilities such as high-intensity running, speed, aerobic capacity (VO_2 max), and strength or power are essential for success in women's soccer. These qualities require the use of both aerobic and anaerobic energy systems. A good training plan should include soccer-specific exercises and plyometric to enhance these skills, lower the chance of injuries, and help players recover better between games and practice sessions.

Participation in sports is a common aspect of human nature and begins to develop from a very young age. The abilities of an athlete are mainly determined by their physical fitness, which includes factors like muscle strength and endurance, heart and lung capacity, flexibility, speed, power, quickness, and balance. These abilities can vary depending on the sport the athlete participates in. The objective of this research was to assess the motor abilities, overall fitness status, and body composition of female football players across various levels of participation.

In light of these limitations, this paper seeks to outline the physical demands of women's soccer across multiple competitive levels using two approaches. The first involves reviewing and comparing previously published research where meaningful comparisons can be made. The second incorporates an original dataset provided by the author (JDV), which includes match data from youth, collegiate, professional, and international competitions. A key strength of this dataset is that all information was collected using the same 5 Hz GPS technology, with consistent performance thresholds applied to every variable. This methodological consistency enables more accurate, direct comparisons across different standards of play within the dataset.

In applied sport settings, evaluating the physical and physiological characteristics of elite athletes plays a key role in talent identification, team selection, and the design of effective training programs. Because female soccer players perform distinct tactical functions, it is essential to analyze their profiles according to their specific playing roles. Traditionally, players are classified into four primary positions—goalkeeper, defender, midfielder, and forward. However, a more detailed classification system distinguishes among goalkeepers, central defenders, full-backs, central midfielders, wide midfielders, and forwards. Previous research has demonstrated position-related differences in physical performance. For example, defenders have been shown to possess greater aerobic endurance than goalkeepers, reflected in higher running speeds at the anaerobic threshold. Findings from the Yo-Yo intermittent endurance test further indicate that wide midfielders exhibit superior aerobic capacity compared with central defenders and forwards. These variations align with match-play observations, where midfielders typically cover greater total distances than defenders. Studies involving youth players have similarly reported that midfielders tend to run longer distances, particularly at low and moderate intensities. All procedures in the referenced research adhered to the ethical standards outlined in the 1975 Declaration of Helsinki and were approved by the relevant institutional review board. Data collection took place during a single laboratory session in the 2009–2010 pre-season period, conducted on weekday mornings between 8:00 a.m. and 12:00 p.m., under controlled environmental conditions (22°C temperature and 45% humidity). The assessment battery included measurements of anthropometric characteristics, flexibility, aerobic fitness, muscular strength, and anaerobic power.

2. Statement of the Problem

The aim of the present study was to find out Comparative study on selected physiological variables among different positional kanyashree cup women soccer players.

3. Methodology

For the purpose of the study 100 women soccer players were purposively selected from various districts of West Bengal who participated in the Kanyashree Cup. The age range of the participants was between 15 - 18 years. A systematic

approach was adopted for the assessment, which included a comprehensive set of measurements across physiological variables. The selection criteria focused exclusively on women actively involved in relative soccer, ensuring a homogenous sample in terms of sport-specific engagement.

4. Criterion Measures

- Peak Expiratory Flow Rate (PEFR): Measured using a peak flow meter (IS Indo Surgicals, Made in India), and values were recorded in liters per minute (L/min).
- Vo_2 max were measured by queen college step test. The result was calculated by formula: Vo_2 max= 65.81-(0.1847x HR bpm) and it recorded in ml/kg/min.

5. Statistical Procedure

They were statistically analyzed by using the analysis of variance (ANOVA) to determine the difference, if any, among the phase on Anthropometrical variables of women goalkeeper, defender, midfielder and sticker. Whenever the obtained 'F' ratio was found to be significant the LSD test was applied as a post hoc test to find out the paired mean differences, if any.

6. Findings

Table 1: Tabular presentation of data in respect of peak expiratory flow rate among Goalkeeper, Midfielder, Defender and Attacker

Group	Mean	SD	Degree of Freedom	"F" Ratio
Goalkeeper	607.2	41.61	(K-1) = 3	1.76
Midfielder	601.6	61.24		
Defender	598.6	67.63	(N-K) = 96	
Attacker	574.2	56.84		

*Significant at 0.05 level of confidence: F 0.05 (3,96)=2.699, Number of Subjects(N)=100
NS- Not significant

Discussion: From the finding of the mean, SD table no.-1 for the variables of the peak expiratory flow rate it is clearly shows that there was no significant difference among goalkeeper, midfielder, defender and attacker. The mean and SD value of peak expiratory flow rate is goalkeeper-607.2±41.61, midfielder-601.6±61.24, defender-598.6±67.63 and attacker- 574.2±56.84The 'F' ratio of peak expiratory flow rate is 1.76 which is less than table value $F_{0.05}$ (3,96)=2.699>1.76.

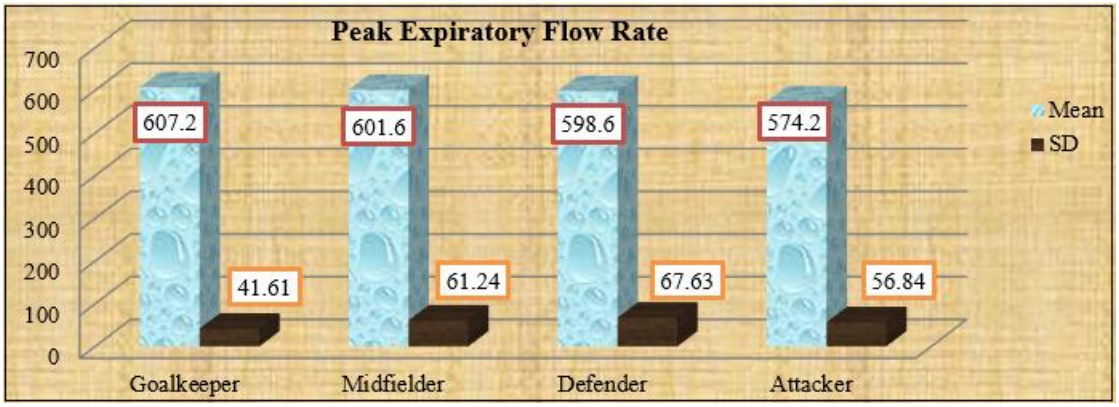

Figure 1: Mean, Standard Deviation on lean peak expiratory flow rate among Goalkeeper, Midfielder, Defender and Attacker

Table 2: Tabular presentation of data in respect of vo_2 max flow rate among Goalkeeper, Midfielder, Defender and Attacker

Group	Mean	SD	Degree of Freedom	"F" Ratio
Goalkeeper	41.25	2.59	(K-1) = 3	0.57
Midfielder	42.25	2.92		
Defender	41.92	2.32	(N-K) = 96	
Attacker	41.58	3.22		

*Significant at 0.05 level of confidence: F 0.05 (3, 96)= 2.699, Number of Subjects(N)=100
NS- Not significant

Discussion: From the finding of the mean, SD table no.-2 for the variables of the vo_2 max it is clearly shows that there was no significant difference among goalkeeper, midfielder, defender and attacker. The mean and SD value of vo_2 max is goalkeeper-41.25±2.59, midfielder-42.25±2.92, defender-41.92±2.32 and attacker- 41.58±3.22The 'F' ratio of vo_2 max is 0.57 which is less than table value $F_{0.05}$ (3, 96) =2.699>0.57.

Figure 2: Mean, Standard Deviation on lean vo_2 max among Goalkeeper, Midfielder, Defender and Attacker

7. Discussion

As per finding of table are concerned to investigate the Relative study on selected physiological variables were found significantly difference.

Goalkeepers are usually the tallest and largest players. Bigger people often have larger lungs and wider airways, which can produce stronger and faster exhalation increasing. After then midfielders perform continuous running for 90 minutes which strongly trains the respiratory endurance system.As well as defenders rely more on positional play and short sprints with less sustained respiratory loading. And at last attackers focus dominance causes earlier respiratory muscle fatigue lowering maximal expiratory output. Role specific effort with less sustained ventilator demand.

Midfielders cover the greatest total distance; highest aerobic load on the body so midfielder's highest vo_2 max among other position of soccer. After then defenders perform more continuous moderate intensity movement and highly anaerobic than attackers and goalkeepers. As well as attackers rely mainly on short explosive sprint, jumps and rapid changes of direction. This limits long duration oxygen utilization. And at last goalkeepers have minimal running distance during matches; their actions are mostly reactive and explosive with long recovery times, so goalkeepers generally lowest vo_2 max in other than playing position of soccer.

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