The Relationship of Opponent Ranking and In-Game Dynamics of Division-1 Women's Basketball

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ABSTRACT

This study examined the relationship between an opponent's NCAA ranking and in-game dynamics of division-1 Women's Basketball. Analysis showed that when playing lower-ranked opponents, athletes covered higher distances, reached higher speeds, and had higher heart rates. This allows coaches to consider additional exertion that may occur from playing opponents of different rankings.

INTRODUCTION

The National Collegiate Athletic Association (NCAA) ranks collegiate women's basketball teams based on their ability to beat their opponents.[1] Research on the effect of these ranking on In-Game Dynamics in Division-1 Women's Basketball is limited. Research completed in field hockey has indicated that when playing higher-ranked opponents, athletes engage in higher-speed activities.[2] Given the differences in court-size and the pace of game, separate research should be done for individual sports. During basketball games, a player's ability to change directions and get to the other side of the court quickly impacts the ability of the team to win, requiring athletes to be able to accelerate and decelerate quickly.[3] Athletes also need to be able to physiologically handle the demands of games, in terms of heart rate, lactate, and mechanical stress.[4] These factors change based on the pace of the game, which can be heavily influenced by the difference in the skill and physical preparation levels of the teams.

PURPOSE

The purpose of this investigation is to examine the effects that playing higher versus lower-ranked opponents has on speed, distance covered, and heart rate in collegiate women's basketball.

METHODS

Sixteen Division 1 Women's Basketball Players (Age: 21 ± 3 yrs; Height: 174.21 ± 19.27 cm; Body Mass: 73.98 ± 11.52 kg) were monitored during matches played between December 2021 and March 2022. The participants were given Polar Team Pro Sensors and straps and were instructed to wear the sensors during all games and practice sessions during the season. Using the polar team pro system sampling at 10 Hz, distance, speed, and heart rate were calculated. The 2022 NET Rankings for Women's Division-1 Basketball were recorded.[4] A Student's T-Test was used to compare the differences in average heart rate, total distance ran, maximum speed, average speed, and distance per minute when faced with a higher-ranked opponent versus a lower-ranked opponent. Cohen's d effect sizes were calculated for each dependent variable to determine the practical significance of each variable across load conditions. A Bonferroni Correction was applied to the data. R version 4.1.2 was used for the data analysis.[5]

Net Rankings[4]

Team	Rank	High or Lower Rank
Boston College	47	
La Salle University	147	
Yale University	161	
Farleigh Dickinson University	222	
Mount Saint Mary College	243	
St Francis Brooklyn College	245	
Wagner College	250	
Army University	252	
Monmouth University	271	
LIU	306	
Merrimack College	309	
Sacred Heart University	321	
Bryant University	328	
Saint Francis University	331	
Central Connecticut State College	337	

RESULTS

The descriptive data for teams ranked higher and teams ranked lower are in Table 1. The average heart rate was higher when playing opponents ranked lower ($p < 0.001$, $d = -0.13$). When playing lower-ranked opponents, the athletes had a higher total distance in meters ($p < 0.001$, $d = -0.22$). The distance per minute in meters was higher when playing lower-ranked opponents than it was when playing higher-ranked opponents ($p < 0.001$, $d = -0.19$). The maximum speed was higher in games played against lower-ranked opponents ($p < 0.001$, $d = -0.25$). The average speed in kilometers per hour was higher when playing lower-ranked teams than when playing higher-ranked teams ($p < 0.001$, $d = -0.11$).

Table 1. Descriptive Statistics

	Ranked Higher (Mean±SD)	Ranked Lower (Mean±SD)
Average Heart Rate (bpm)	119.49 ± 22.10	122.41 ± 22.00
Total Distance (m)	3271.22 ± 2060.00	3735.44 ± 2070.03
Distance/min (m/min)	23.04 ± 14.00	25.74 ± 14.24
Maximum Speed (km/h)	21.96 ± 4.19	22.96 ± 3.76
Average Speed (km/h)	1.54 ± 0.88	1.64 ± 0.86

DISCUSSION

The purpose of this study was to determine the relationship between an opponent's ranking and the speed, distance, and heart rates of division-1 women's basketball players. The data indicated that when playing against teams that have lower rankings, the athletes had higher average speeds, maximal speeds, total distance covered, and heart rates. The opposite was true when playing teams that had higher rankings, the athletes moved at slower speeds, covered less distance, and had lower average heart rates.

DISCUSSION cont.

Given the differences in field length, game time, and pace between different sports, assessing each sport individually is more appropriate to determine the effects. Future studies should be completed in other sports to assess how each sport varies. Additionally, this study was completed on a team ranked in the bottom fifty in Division-1. This study should be repeated on teams with various ranking to see if the ranking of the team the study is on, effects the outcome of the study.

CONCLUSION

When playing opponents with lower rankings, the athletes covered more total distance, reached higher speeds, and had higher heart rates than when playing against teams with higher-rankings. Coaches should take into consideration additional exertion that may come from the strength of the opponents.

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