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A statistical approach to select which players to put on the field during a Wheelchair Basketball championship.

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INTRODUCTION:

Game performance in Wheelchair Basketball (WB) is represented by season statistics in terms of winning records, average points from both field-goals and free throws, rebounds, assists, and steals per match. How to optimize the factors contributing to the success of game performance and how to select players are primary concerns of the coaches and the technical staff. In order to explore the factors contributing to the success of the match, Cluster Analysis was applied in WB game performance data.

METHODS:

Data related to a complete regular season of the top Italian WB Championship 101 athletes of 8 different teams and 56 matches) were considered for analysis. Based on seven scores of the athletes' performance normalized by the time spent by each player in the field during each match (i.e., the number of free-throw points made [FTM], number of two-point field-goals made [P2M], number of three-point field-goals made [P3M], total points made per match [PTS = FTM + P2M + P3M], number of steals [ST], number of rebounds [REB] and number of assists [AS]), the suitable number of clusters was determined by the hierarchical ward clustering method. The k-means clustering technique with the defined number of clusters was then performed to determine cluster membership for each participant.

RESULTS:

Based on data related to the first round of the Championship (i.e., 28 matches), two cluster solution to explaining about 35% of the total variance was considered to produce the optimal cluster size for detailed groups whilst maintaining meaningful differences between the clusters. Cluster 1 was composed by high performing athletes, while Cluster 2 is composed by low performing athletes. Based on data related to the second round of the Championship, the regression analysis conducted with the performance of each team (winning or losing), showed that teams where players belonging to the Cluster 1 had played more time during the second round of the championship were also those with the better team performance (Adjusted R-squared = 0.48 and P = 0.035).

CONCLUSION:

The results of the present study provided a practical tool for WB coaches based on statistical techniques to support their tactical decisions in order to answer the coach's question: "By what criteria can I select which players to put on the field during a WB championship?".

Topic: Disabilities

Presentation Poster

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