Sports Coaching

Could physical, technical, and tactical variables differentiate the top players of the 2018 FIFA World Cup?

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Abstract - Aim: This study aimed to analyze the difference between tactical, technical, and physical variables in selected and unselected top players of the 2018 FIFA World Cup. **Methods:** A sample data of 1049 soccer players were collected by the multiple-camera computerised tracking system. Subsequently, data were analyzed and divided into two groups: selected (man of the match and top 10 players of the World Cup) and unselected players (other players). Twenty-six performance variables were used to assess tactical (passing), technical (goals, assist, shots, and fouls), and physical variables (height, distance covered, distance with and without the ball, number of sprints, maximal speed, and intensities zone 1 [low] to 5 [high]). **Results:** The selected players had more tactical (performed and completed more long, middle, and short pass), technical (goal for, assist, shots, shots on goal, fouls committed on them), and physical variables (covered more distance and distance with the ball, more sprints, greater speed and distance in low intensity [zone 1]). However, they were shorter in height and covered less distance in moderate intensity [zones 2 and 3] when compared to unselected players ($p < 0.05$). **Conclusion:** This study suggests that the selected players have more tactical, technical, and physical variables than the unselected players. Our findings could be used as a trustworthy tool (performance variables) to characterize the top players of the World Cup.

Keywords: performance, game analysis, team sport, football, talent.

Introduction

Soccer had the highest share (43%) of worldwide revenues from sports events in 2017[1], show has a high public consumption of its products from its public, who buy tickets at stadiums, from merchandising products, and transmissions of leagues or championships[2]. In addition, during the FIFA World Cup (WC), one of the most important events in the World, there is high commerce in soccer products. One of the reasons for this is that the talented and famous players, participants in the biggest leagues and championships of the World soccer, are involved. Therefore, the presence of these players, the passion for national soccer teams, and the competitive environment attract a large number of fans and spectators, contributing to the success of the competition[1].

At the end of each match, a featured player is selected as top of the match (man of the match) and at the end of the FIFA WC, the top 10 players are chosen to compete for the golden ball. However, the performance variables that differentiate and highlight these selected players from others are not clear, although the variables of high-level soccer are already well established in the literature, both in the analysis of teams[3-5] and in the personal characteristics[6,7]. Additionally, it is well known that more technically and tactically proficient players tend to have greater ability and more spotlight opportunities[8].

Previous studies have demonstrated that match performance assessment should include physical, mental, tactical, and technical variables[5]. For example, previous studies have shown that the pass accuracy[3,7], number of goals, assists, shots, shots on goal, and corners, are associated with team success[5,9,10]. In addition, it has been recently suggested that physical variables influence the technical and tactical variables[11]. Therefore, the analysis of several variables is necessary to understand if these variables are different between the selected and unselected players in the 2018 FIFA WC.

Considering the above, determinant variables of success in world-class soccer competition can be specified and the determining factors of individual performances of the top players can be identified. If team performance is due to tactical, technical, and indirectly physical variables, the man of the match and the top 10 players may have those variables to a greater extent than the other players. Therefore, in this study, we analyze and compare tactical, technical, and physical variables in selected players (man of the match and top 10 players) and unselected players of the 2018 FIFA WC.

Methods

Participants

Through the FIFA website with free public access (www.fifa.com/worldcup/matches), 1049 data from midfielder and forward players were analyzed and divided into two groups: selected (man of the match and top 10 players; n = 84) and unselected players (n = 965). For the man of the match, the fans, through popular vote on FIFA's various digital platforms, chose the player they thought most deserved the individual post-match award. In addition, the top 10 players were chosen by members of the FIFA technical study group to compete for the golden ball. This data of the top 10 players were considered throughout the competition (i.e. in all matches when the players were on the field). For the analysis of the selected player's group, the man of the match was added to the top 10 players of the 2018 FIFA WC. Due to disparate characteristics of the player's positions, the data about defense players (goalkeepers, defenders, and fullbacks) and players with incomplete data were deleted.

Data analysis

Twenty-six performance variables were codified and calculated by a tracking system, and later were divided to assess technical (goals completed, assists, shots, shots on goal, fouls committed, and fouls suffered), tactical (passing), and physical variables (height, distance covered, distance with the ball, distance without the ball, sprints, fastest speed and zones of intensity: zone 1 [low] to zone 5 [high]). Table 1 shows the measured and analyzed results for a match.

A large number of previously published studies have used the same methods for scientific interpretation based on this free data, indicating the reliability and validity of the tracking system used by FIFA[4,12-16]. The database of the tracking system of FIFA is provided by the company STATS® (Chicago, IL, USA) and they used a real-time optical that operated at 25 frames per second and each frame provides details of all players on the match[16]. The authors declare no financial conflicts of interest related to the research reported in the manuscript. The study was conducted according to the guidelines of the Declaration of Helsinki.

Table 1 - Tactical, technical, and physical variables were analyzed between selected and unselected players.

Variables		Measurement
Tactical	Long pass (n)	Long pass for a team player
	Long pass completed (n)	Long pass completed for a team player
	Long pass accuracy (%)	Long pass completed / long pass performed
	Median pass (n)	Median pass for a team player
	Median pass completed (n)	Median pass completed for a team player
	Median pass accuracy (%)	Median pass completed / long pass performed
	Short pass (n)	Short pass for a team player
	Short pass completed (n)	Short pass completed for a team player
	Short pass accuracy (%)	Short pass completed / long pass performed
Technical	Goals for (n)	Goals completed and validated by referee
	Assists (n)	Assist a team player to complete a goal validated by the referee
	Shots (n)	An attempt to score a goal, either on or off-target
	Shots on goal (n)	An attempt to score a goal and that got on target
	Fouls committed (n)	Foul committed on an opponent was marked by the referee
	Fouls suffered (n)	Foul suffered and was marked by the referee.
Physical	Height (cm)	Height of player - distance from head to foot
	Distance covered (m)	Total distance covered by the player
	Distance with the ball (m)	Total distance covered by the player when his team has ball possession
	Distance without the ball (m)	Total distance covered by the player when the opposite team has ball possession
	Sprints (n)	Total sprints made by the player
	Maximal speed ($km.h^{-1}$)	Maximal speed made by the player during the match
	Intensity 1 (%)	Distance covered between 0 and 7 $km.h^{-1}$
	Intensity 2 (%)	Distance covered between 7 and 15 $km.h^{-1}$
	Intensity 3 (%)	Distance covered between 15 and 20 $km.h^{-1}$
	Intensity 4 (%)	Distance covered between 20 and 25 $km.h^{-1}$
	Intensity 5 (%)	Distance covered above than 25 $km.h^{-1}$

Statistical analysis

Data were reported as mean and standard deviation. The Kolmogorov-Smirnov and Levene tests were used to assess normality and homoscedasticity. A one-way analysis of variance (ANOVA) was used to compare tactical, technical, and physical variables between the selected and unselected players. The Tuckey post-hoc test was used to check the differences between the groups. The effect sizes were assessed by partial eta-squared ($_{p}n^2$) analysis. All analyses were performed with *Statistica*® software, version 6.0 (Statsoft Inc.). A statistically significant difference was considered when $p < 0.05$.

Results

The tactical variables of the soccer matches showed a main effect of players group ($p = 0.001$; $eta^2_{partial} = 0.048$) (Figure 1). We observed that the selected players performed and completed more long passes ($p = 0.006$; $p < 0.001$), middle ($p = 0.005$; $p = 0.031$) and short passes ($p = 0.001$; $p < 0.001$), besides having higher accuracy in long pass ($p = 0.001$) when compared to unselected players.

Figure 2 shows that the technical variables of the soccer matches showed a main effect players group ($p = 0.001$; $eta^2_{partial} = 0.292$). The post hoc showed that selected players performed completed more goals for ($p < 0.001$), assists ($p = 0.001$), shots ($p < 0.001$), shots on goal ($p < 0.001$) and fouls suffered ($p < 0.001$) when compared to unselected players.

Figure 3 shows that the physical variables of the soccer matches were significant when comparing the selected players with the others showed a main effect of players group ($p < 0.001$; $eta^2_{partial} = 0.055$). The post hoc showed that the selected players showed higher distance covered ($p < 0.001$), distance with ball ($p < 0.001$), sprints ($p < 0.001$), maximal speed ($p = 0.045$) and distance in the intensity 1 ($p = 0.001$), less height ($p < 0.001$), and distance in the intensity 2 ($p = 0.001$) and 3 ($p = 0.008$) when compared to unselected players.

Discussion

The main finding of this study was that the selected players had higher tactical (passing), technical (goals completed, assists, shots, shots on goal, fouls suffered), and a physical level (distance covered, distance with ball, distance covered in low intensity) than the unselected players. In addition, the selected players had shorter stature and distance covered in moderate intensity. Our findings showed that the selected players were better in on key variables of the match performance, providing useful information to identify the top players during high-level competitions.

With respect to tactical variables, our data showed that the selected players performed and completed shorter, middle, and long passes. It has been shown that a higher number of passes and completed passes can determine match success[3,7,17]. This finding may be related to the leadership of the players on the team, mainly due to their high level of skills (i.e. technical and tactical variables). In fact, a recent study showed that success during a soccer match increases due to the short and middle pass completed (+12% for both forms of passes)[4]. In addition, a long pass (i.e. cross) can assure the chance of success and unpredictability, increasing unexpected goal opportunities[4,18].

Our study revealed that the selected players achieved more goals, assists, shots, and shots on goal, which may indicate their higher participation in offensive actions, associated with successful teams. Moreover, keeping the ball on the field and making more passes (continuously and consciously) increases the scoring opportunities (i.e. through assists, shots, shots on goal, and goals completed)[4]. We found a higher number of fouls suffered by the selected players. This is probably due to the knowledge the greatest of their greater technical and physical skills, leading the opponents to mark them and create fouls to keep them from playing freely.

For the physical variables, our data suggest that the selected players achieved longer distance covered and greater distance with the ball. In the same way, according to Chmura et al.[19], the winners' team of the 2014 FIFA WC covered a significantly greater distance than the losers. In relation to distance covered with the ball, a previous study has shown no significant difference ($p = 0.07$) between winners and losers of FIFA WC 2014[20]. This previous study, however, only analyzed the team actions without touching on the relevance of the selected players. The hypothesis for our findings on the contrary is that the selected players covered more distance in possession of the ball, thus increasing their share in building offensive actions and increasing their opportunities to score a goal. Moreover, the selected players were shorter, which can increase agility, facilitating control and driving of the ball, dribbles, passes, and shots [21]. In this sense, this longer ball retention is a feature of the possession-play style, that increases the ball possession and creates precise, well-constructed, and repeatable interactions among the soccer players[8].

Interestingly, the selected players showed a combination of the physical variables, such as higher maximum speed, number of sprints, and distance in low intensity [zone 1], and less distance in moderate intensity [zones 2-3]. These players sprinted faster and recovered in the low-intensity speed [zone 1], unlike the unselected ones who seemed to use moderate intensity [zones 2-3] to support the lower technical and tactical variables. Previous studies have shown that these moderate intensities are not decisive in the final performance of high-level soccer matches.

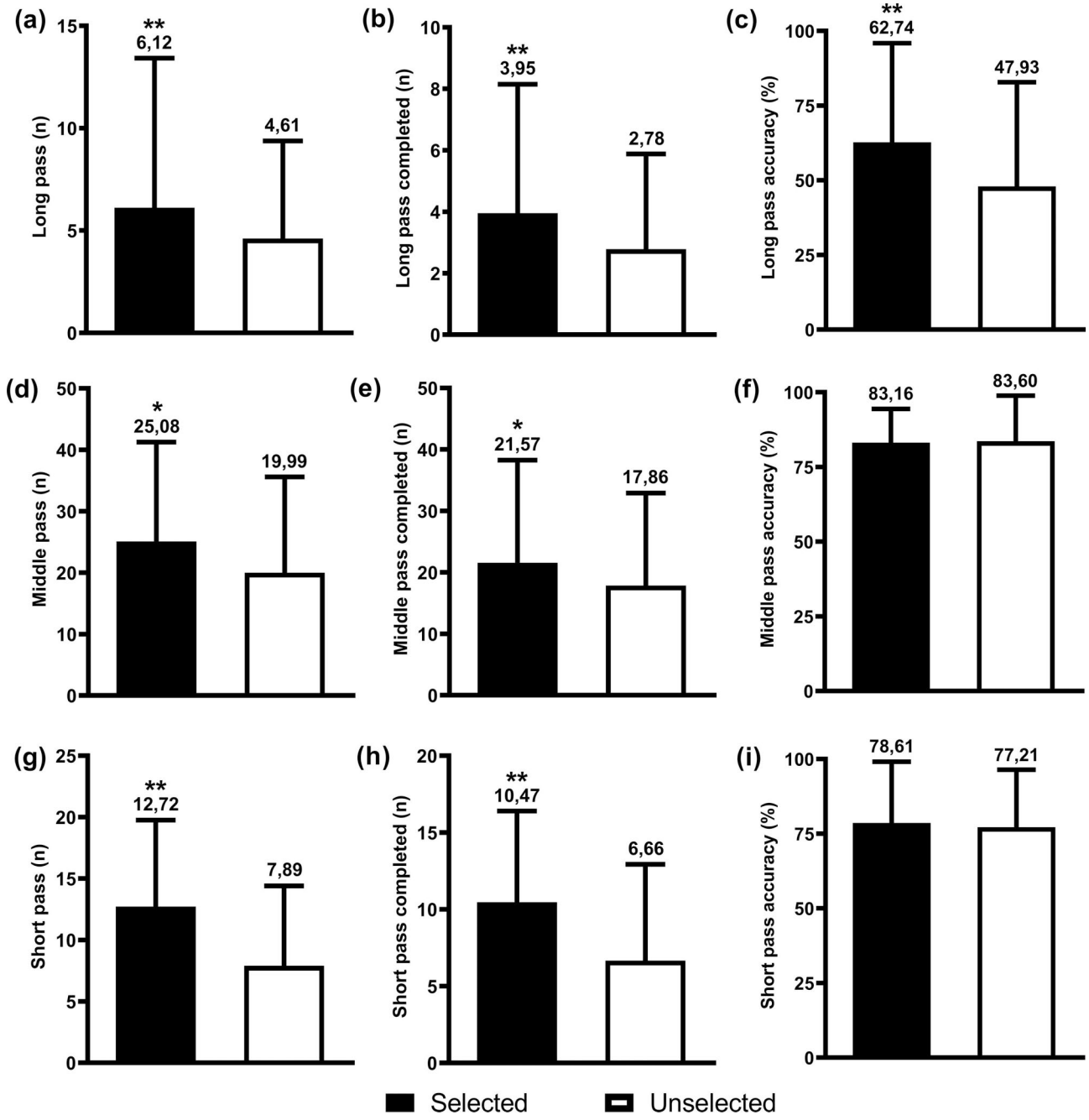

Figure 1 - Tactical variables of soccer players. Black bars: selected players. White bars: unselected players. ∗statistically significant difference ($p < 0.05$); ∗∗statistically significant difference ($p < 0.01$).

In fact, a previous study showed that beginning players (10−14 years old) have better sprint times than non-starter players[22], affecting their soccer performance[19,22]. Thus, a higher aerobic/anaerobic metabolism allows players to cover longer total distances, perform more sprints, recover faster from repeated sprints and develop better match dynamics for a much longer period[23,−25].

Considering the relevant changes in professional soccer over the last decade[26], mainly from the point of view of performance analysis[27], our findings suggest that the success of soccer players is dependent on tactical, technical, and physical variables in addition to high levels of skill and playing style previously showed[3,5,22]. Thus, these performance variables can directly indicate the characteristics of the top soccer players in the world. Further studies should investigate whether these differences in the variables of performance that seem to make the top players selected are related to the playing style of

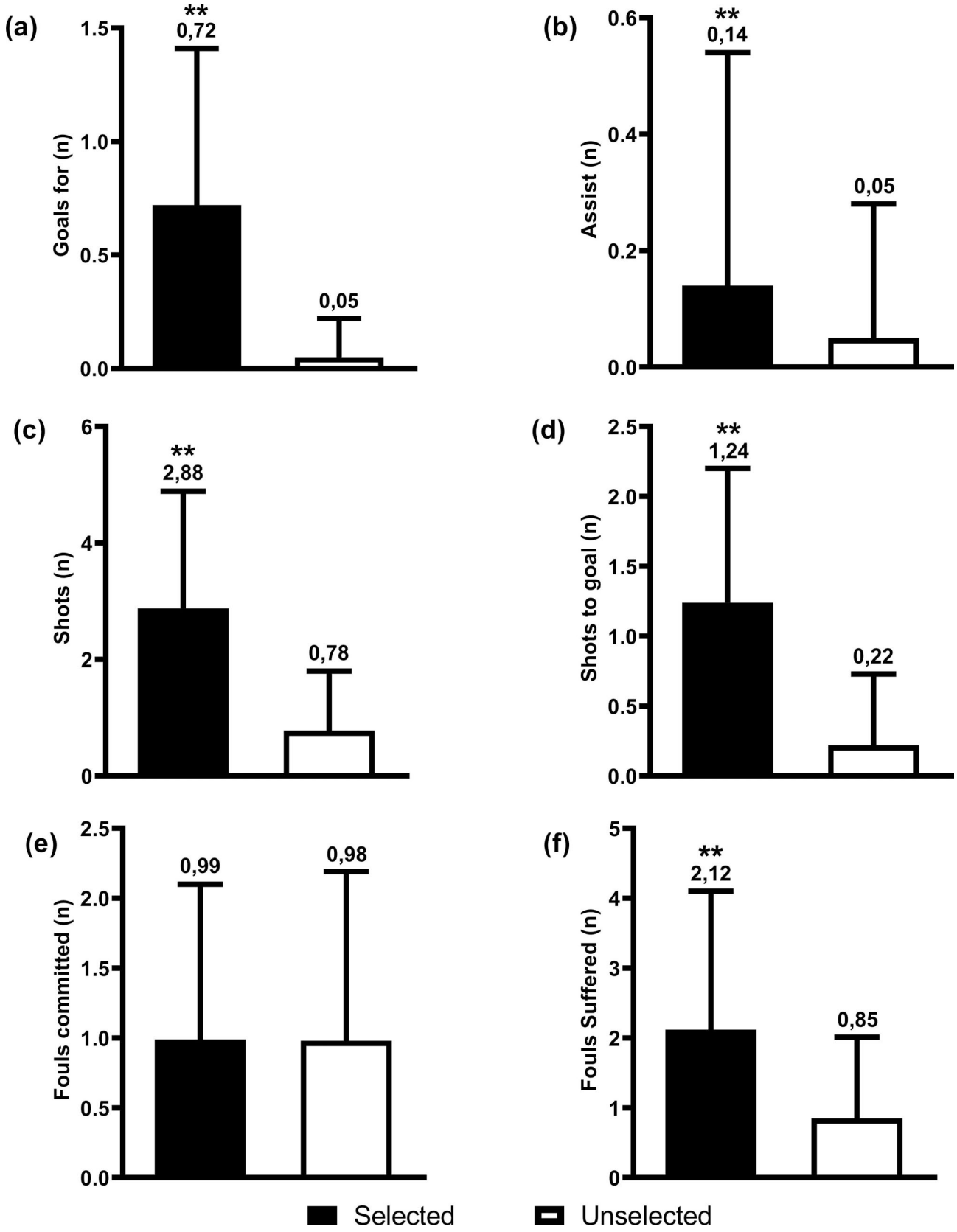

Figure 2 - Technical variables of soccer players. Black bars: selected players. White bars: unselected players. ∗statistically significant difference ($p < 0.05$); ∗∗statistically significant difference ($p < 0.01$).

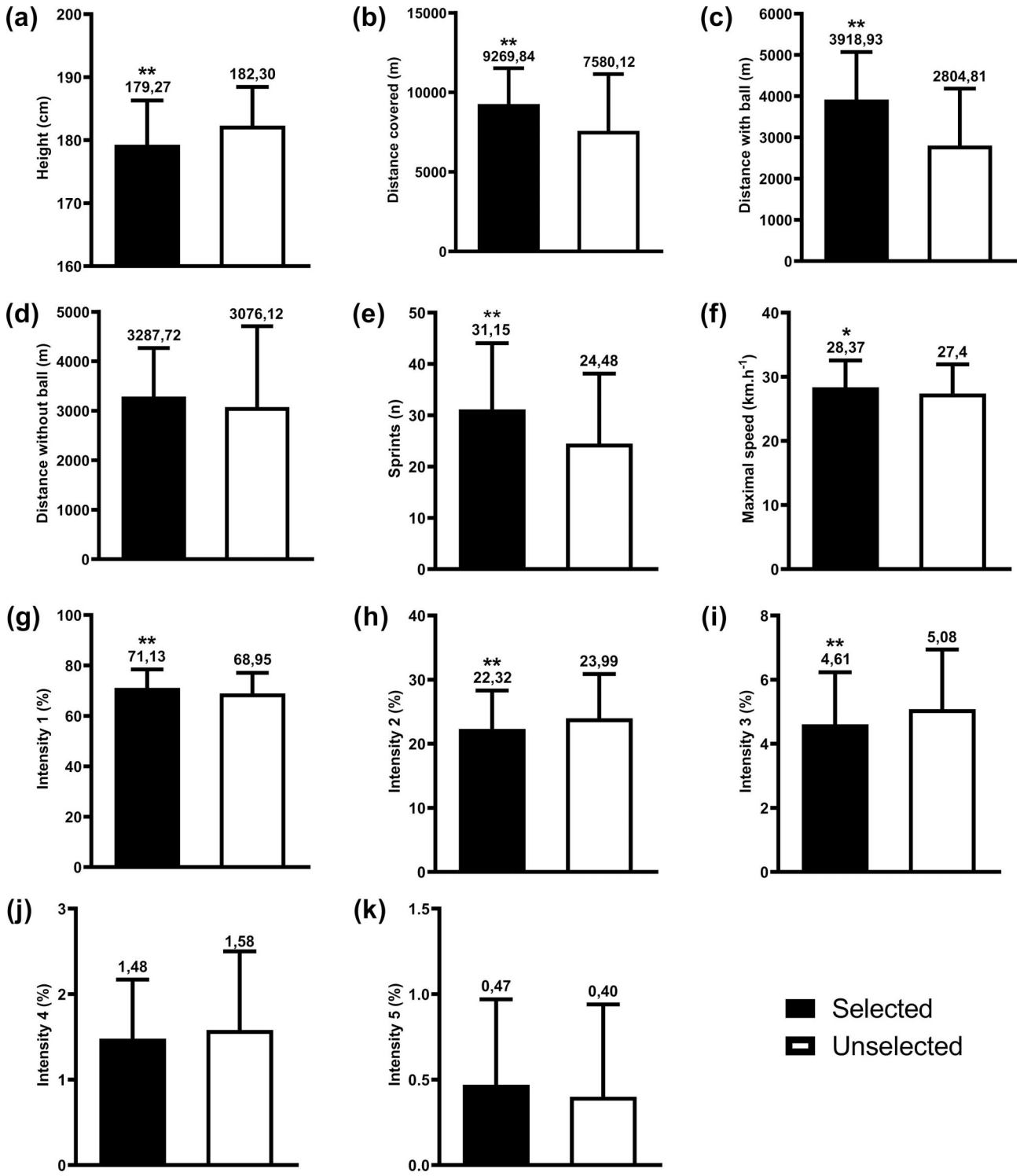

Figure 3 - Physical variables of soccer players. Black bars: selected players. White bars: unselected players. ∗statistically significant difference ($p < 0.05$); ∗∗statistically significant difference ($p < 0.01$).

their teams. Moreover, check whether these selected players have higher indicators in decisive matches or the different phases of the WC. The limitations of the present study are the difference in the number of players between the samples analyzed and the possible influence of the weather, opponent, stages of the WC, and partial score during the match.

Conclusion

This study indicated that the selected players (man of the match and top 10 players) performed better than unselected players. Our findings could be used as a trustworthy tool (performance variables) to characterize the top players of the WC and that helps the coaches/trainers to target the playing style of their teams based on the selected players that present the higher performance variables.

Conflicts of interest

The authors report no conflict of interest.

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