

Age behaviour and variables of success in FIFA World Cup from 1998 to 2018

Comportamiento de la edad y variables de éxito en la Copa Mundial de la FIFA desde 1998 hasta 2018

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Abstract. This study aimed to analyse the influence of age on variables such as the number of participations, club confederation, national team confederation, playing position, team performance, year celebration, and total minutes played during FIFA World Cup (FWC) from 1998 to 2018. The sample was composed of all players who participated in the FWC from 1998 to 2018 and played at least one minute ($n = 3529$). Data were examined using descriptive analysis, a one-way ANOVA, and linear regression. The main finding of the current study was that the average age of participants in the FWC was 26 years, with goalkeepers and central defenders being the playing positions with the highest average age while wingers have the lowest average age. The youngest players belong to CAF clubs and national teams, while the oldest players belong to CONCACAF. Finally, the players who completed a higher percentage of minutes have a higher average age (26.5 years), while the winners (25.4 years) have a lower average age than the finalists (26.9 years). These results provide useful information regarding at what age players reach their peak performance and could provide valuable information to national federations and national team coaching staff.

Keywords: age of peak performance; soccer; performance analysis; performance indicators; playing position.

Abstracto. Este estudio tuvo como objetivo analizar la influencia de la edad en variables como el número de participaciones, confederación de clubes, confederación de selecciones nacionales, posición de juego, rendimiento del equipo, celebración del año y minutos totales jugados durante la Copa Mundial de la FIFA (FWC) de 1998 a 2018. La muestra estuvo compuesta por todos los jugadores que participaron en la FWC de 1998 a 2018 y jugaron al menos un minuto ($n = 3529$). Los datos se examinaron mediante análisis descriptivo, un ANOVA unidireccional y regresión lineal. El principal hallazgo del presente estudio fue que la edad media de los participantes en la FWC fue de 26 años, siendo los porteros y los defensores centrales las posiciones de juego con mayor edad media, mientras que los extremos tienen la edad media más baja. Los jugadores más jóvenes pertenecen a clubes y selecciones nacionales de la CAF, mientras que los jugadores de mayor edad pertenecen a la CONCACAF. Finalmente, los jugadores que completaron un mayor porcentaje de minutos tienen una edad media superior (26,5 años), mientras que los ganadores (25,4 años) tienen una edad media inferior a la de los finalistas (26,9 años). Estos resultados proporcionan información útil sobre la edad a la que los jugadores alcanzan su máximo rendimiento y podrían proporcionar información valiosa a las federaciones nacionales y al cuerpo técnico de las selecciones nacionales.

Palabras clave: edad de máximo rendimiento; fútbol; análisis del rendimiento; indicadores de desempeño; posición de juego.

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Introduction

The FIFA World Cup (FWC) is one of the most popular soccer events, and is considered the main official tournament at the international level in this sport (Junge & Dvořák, 2015; Tuo et al., 2019). This tournament takes place every four years, so professional soccer players have few opportunities to play it during their careers since sporting life has a limited number of peak performance years (Carapinha et al., 2019). However, the average age at which soccer players end their careers is increasing, so the opportunities to participate in these tournaments have expanded in recent years (Kalén et al., 2019). In this regard, Carapinha et al. (2019) noted that professional soccer players retire between 31 and 35 years of age, while the duration of their professional career lasted between 8 to 11 years. In this line, Kalén et al. (2019) observed an increment in the players' average age who participated in the UEFA Champions League (UCL), from 24.9 to 26.5 years, also shows that more than 80% of the participants were between 21 and 29 years. Similarly, Dendir (2016) reported that the age of most players in major European leagues ranged from 21 to 29 years. More specifically, Dendir (2016) concluded that the average age of the teams participating in the FWC 2010-2014 was 27.5 and 27.37

respectively. Considering the findings of previous studies, it would be possible to assume that professional soccer players could maintain their physical performance to increase their participation up to two times in the FWC. Despite the age evolution, it is noteworthy that beyond the age of 30 physical performance decreases (e.g., total distance covered -3.4%, number of fast runs -12%, number of sprints -21%), while technical performance (e.g., % successful passes) increases (2.28%) (Sal de Rellán-Guerra et al., 2019) and increases (0.25% per year) (Rey et al., 2022). In addition, a recent study showed that younger soccer players (18–24 years old) cover a greater total distance. They also cover a greater distance at high intensity and a greater number of efforts at high intensity at any given time during the season (García-Calvo et al., 2023). Furthermore, the coefficient of variation for high-intensity activities and sprinting in professional soccer players under 25 years old is lower than for soccer players older than 33 years old (Lorenzo-Martínez et al., 2020).

Although prior studies point to the peak age of players being between 25 and 27 years old (Dendir, 2016; Sal de Rellán-Guerra et al., 2019), it should be noted that this peak performance varies according to playing positions. Specifically, forwards peak at age of 25 years, defenders at age of 27 years, and midfielders between 25 and 27 years

(Dendir, 2016). Meanwhile, Sal de Rellán-Guerra et al. (2019) found that center backs (CB), center midfielders (CM), wingers (W), and forwards (F) are the positions most affected due to the increase in peak age in the first German league (Bundesliga). These authors also reported that all playing positions, except fullbacks (FB), suffered a significant decrease in their physical demands for players aged ≥ 30 years, which could be related to the increase in peak age in the previously mentioned playing positions. Otherwise, it has been observed that in the last three decades of the UCL, goalkeepers (GK) and CB tended to peak later than the rest of the playing positions, maintaining their peak until the age of 31 (Kalén et al., 2019). In this sense, there seems to be a tendency towards a more defensive and less direct play, so that the positions of GK and CB could play a greater role (Errekaigorri et al., 2022). These findings can be explained by the differences in physical demands according to playing position (García-Calvo et al., 2022; Modric et al., 2022). On the other hand, Oterhals et al. (2021) studied the age of soccer players when they were nominated for major individual awards worldwide and observed that the age of peak performance (APP) is around 27-28 years, varying between playing positions from 26 to 31 years. Based on these studies, it seems pertinent to think that depending on the playing position, the number of participations in FWC could vary, although studies in this regard seem necessary to confirm it.

Another variable that could be affected by APP is the players' confederation of origin. In this regard, due to differences in cultural, geographical, social, and historical aspects, soccer players from different countries and continents are often characterized by different playing particularities (Sapp et al., 2018; Sarmiento et al., 2013, 2020). In this sense, Tuo et al. (2019) analysed the differences in match running performance of soccer players during matches across continental confederations, concluding that soccer players' running performance during matches was different among all confederations during the 2018 FWC. Also, they highlighted that the high-speed-running distance covered by CONCACAF players was less than that by CAF players. These differences could influence the APP of soccer players depending on their confederation. Similarly, some studies have shown that each national league presents different particularities depending on the country in which it is played (Bloomfield et al., 2005; Sapp et al., 2018). Bloomfield et al. (2005) concluded that in the major European soccer leagues, Bundesliga players had the highest height, body mass, and Body Mass Index (BMI), while La Liga players had the lowest height, and Serie A players had the lowest body mass and BMI. It could be deduced that APP could vary depending on the individual characteristics of the professional soccer leagues where players are participating. Therefore, knowing at what age players reach their peak performance could provide valuable information to national federations and national team coaching staffs. However, to date, this topic has not been assessed.

Despite this, and according to Rey et al., (2023) all the

investigations analysing the behaviour of age in professional soccer players follow a cross-sectional design, so longitudinal studies must be conducted for this purpose, in order to avoid the influence of variables such as genetics or lifestyle. For this reason, the main aim of this study was to analyse the influence of age on variables such as the number of participations, club confederation, national team confederation, playing position, team performance, FWC year celebration, and total minutes played during FWC from 1998 to 2018. Based on previous studies (Dendir, 2016; Kalén et al., 2019), the hypothesis put forward for this work i) was that the APP occurs in the mid-20s and is different according to playing position, ii) that the club confederation of origin and the total number of minutes played are markers of success.

Methods

Participants and data procedure

The sample consisted of all players who participated in the FWC from the start of its modern format in the 1998 to 2018 and played at least one minute ($n = 3529$). Participations were recorded by tournament, so some players may have played on more than one occasion. The variables used for the study were the following: age of the players, number of participations, soccer players' club confederation, the national team confederation, playing position, team performance in each tournament, FWC year celebration, and the total number of minutes played in each tournament. All variables were collected from the Transfermarkt website (www.transfermarkt.es) (Peeters, 2018). As in previous studies, the variable age was grouped into five categories: 16-20 (G1), 21-25 (G2), 26-30 (G3), 31-35 (G4), and >35 (G5) years (Botek et al., 2016; Kalén et al., 2019). The confederations included in this study were: UEFA in Europe, CONMEBOL in South America, CONCACAF in North, Central America and the Caribbean, CAF in Africa, AFC in Asia, and OFC in Oceania (Lago-Peñas et al., 2019). For the confederations, the official FIFA website (www.fifa.com) was used as a source. For playing position, six sub-groups were established: goalkeepers (GK, $n = 233$), center backs (CB, $n = 685$), fullbacks (FB, $n = 468$), center midfielders (CM, $n = 1016$), wingers (W, $n = 423$) and forward (F, $n = 704$) (Kalén et al., 2019). In line with previous studies, the team performance was decided by how far the team reached in the FWC: group phase, eight-final, quarterfinal, semifinal, final, and winner (Kalén et al., 2019). The variable total number of minutes played was previously used by Dendir (2016). Since players who reach the final played more minutes than their counterparts, the variable total minutes was calculated as the percentage of minutes played over the maximum possible, and these percentage was divided into quartiles as follow: Q4 (1%-25%), Q3 (25.1%-50%), Q2 (50.1%-75%), Q1 (75.1%-100%).

Data analysis

Descriptive data are presented as mean values and SD

(mean ± SD). For the assumption of normality, the Kolmogorov-Smirnov test was used, which confirmed that the data had a normal distribution, while the Levene test showed that the variance was homogeneous. ANOVA statistical test with Bonferroni post-hoc was used to evaluate the differences between mean ages and the rest of the analysed variables (i.e., club confederation, national team confederation, playing position, number of participations, team performance, FWC year celebration, quartile minutes played and age groups). Cohen's D was used to calculate the effect size, using the following classification: trivial (<0.2), small (0.2–0.59), moderate (0.6–1.19), large (1.2–1.99), very large (2.0–3.99), and extremely large (≥4.0) (Hopkins et al., 2009). Finally, a linear regression was used to determine the degree of influence of the number of participations (NP), club confederation (CC), national team confederation (NTC), playing position (PP), whether it was their first FWC (FFWC), team performance (TP) and on age behaviour (AGE). Negative coefficients indicate lower age while positive coefficients indicate higher age. β1 is the intercept; β2, β3, β4, β5, β6, β7 are the impacts of each of the independent variables; and ε1 is the error term. The regression model is as follows:

$$AGE = \beta_1 + \beta_2 NP + \beta_3 CC + \beta_4 NTC + \beta_5 PP + \beta_6 FFWC + \beta_7 TP + \epsilon_1$$

Statistical significance was set at $p < 0.05$. All statistical analyses were performed using IBM® SPSS® Statistics 21 for Macintosh (IBM Co., New York, NY, USA).

Results

Age distribution

Figure 1 shows the age distribution of all players who participated in the FWC between 1998-2018. The age of the players ranged from 16 to 44 years, being the mean age 26.12 ± 3.83 years and the mode and median 26 years. From 28 years and onward, there is a substantial yearly decrease in the number of players. Age groups G1 and G5 accounted for 6.9% and 0.7% respectively, while 92.4% of participants were aged between 21-30 years, G2 (37.8%), G3 (41.6%), and G4 (13%). Additionally, Figure 2 shows the age trend of each NTC with respect to the FCW year celebration.

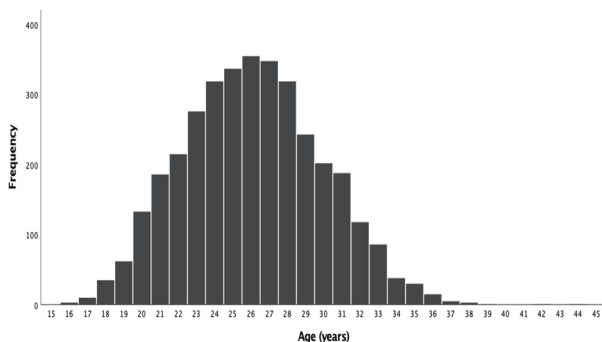


Figure 1. Age distribution of FIFA World Cup players from 1998 to 2018

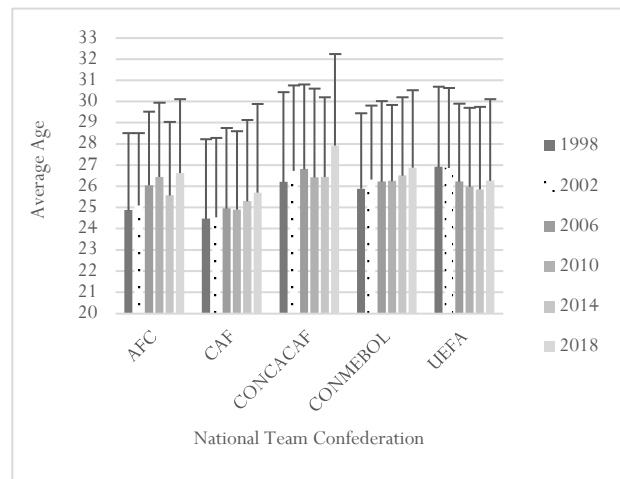


Figure 2. Age trend of National Team Confederation regarding to FCW year celebration

Table 1. Descriptive analyses of FIFA World Cup players from 1998 to 2018

CATEGORY	VARIABLE	OVERALL	
		N	%
AGE Group	16-20	243	6.9%
	21-25	1333	37.8%
	26-30	1467	41.6%
	31-35	460	13%
	>35	26	0.7%
Number of Participations	1	2568	72.70%
	2	744	21.10%
	3	190	5.40%
	4	25	0.70%
	5	2	0.10%
Club Confederation	UEFA	2676	75.8%
	CONMEBOL	186	5.3%
	CONCACAF	250	7.1%
	CAF	78	2.2%
	AFC	333	9.4%
	OFC	6	0.2%
National Team Confederation	UEFA	1576	44.7%
	CONMEBOL	567	16.1%
	CONCACAF	357	10.1%
	CAF	567	16.1%
	AFC	448	12.7%
Playing Position	OFC	14	0.4%
	GK	233	6.6%
	CB	685	19.4%
	FB	468	13.3%
	CM	1016	28.8%
	W	423	12%
F	704	19.9%	

Notes: GK: Goalkeepers; CB: Center Backs; FB: Fullbacks; CM: Center Midfielders; W: Wingers; F: Forward

Table 1 shows the descriptive data of the analysed variables. Regarding club confederation, 75.8% of all participants come from UEFA clubs, while the remaining 24.2% come from other confederations, with the second highest number of players coming from the AFC (9.4%) followed by CONCACAF (7.1%), CONMEBOL (5.3%), CAF (2.2%) and OFC (0.2%). Attending to the National team confederation, of all participating teams, 45% belong to UEFA, followed by CONMEBOL and CAF with 16.1% each, CONCACAF 10%, AFC 12.7%, and OFC 0.4%. Regarding to playing positions, CM represented 29% of the

participating soccer players, followed by F (20%), CB (19.4%), W (12%), FB (13.3%) and GK (6.6%). Finally, the descriptive analysis of number of participations showed that 27.2% participate more than once in the FWC. Of this percentage, 21% corresponds to those who participate twice, while the remaining 72.8% have only participated once.

Descriptive data and differences between the variables in each category according to mean age are presented in Table 2. Firstly, regarding the number of participations, the more participations in the FWC a player has, the older he is. Two participations vs one participation ($p < 0.001$, moderate). Three participations vs one ($p < 0.001$, large) and vs two ($p < 0.001$, moderate). Four participations vs one ($p < 0.001$, very large), vs two ($p < 0.001$, large), and vs three ($p < 0.05$, moderate). Five holdings versus one ($p < 0.001$, very large) and versus two ($p < 0.01$, very large). In terms of confederations, on the one hand, regarding club confederation, CONCACAF had a higher mean age than UEFA ($p < 0.001$, small), CAF ($p < 0.001$, small), and AFC ($p < 0.001$, small). CONMEBOL also had a higher

mean age than CAF ($p < 0.05$, small). On the other hand, National teams belonging to the CONCACAF confederation had a higher mean age than CAF ($p < 0.001$, small) and AFC ($p < 0.01$, small). All other confederations had a higher mean age than CAF; UEFA ($p < 0.001$, small), CONMEBOL ($p < 0.001$, small), and AFC ($p < 0.001$, small). In terms of playing position, GK had a higher mean age than CB ($p < 0.001$, moderate), FB ($p < 0.001$, moderate), CM ($p < 0.001$, moderate), W ($p < 0.001$, moderate) and F ($p < 0.001$, moderate). CB had a higher mean age than FB ($p < 0.05$, small) and CM ($p < 0.01$, trivial), W ($p < 0.001$, small), and F ($p < 0.001$, small). W players had the lowest mean age compared to FB ($p < 0.001$, small), CM ($p < 0.001$, small), and F ($p < 0.01$, small). As for the final outcome, the finalists had a significantly higher mean age than the winners ($p < 0.05$, small). No significant differences were observed in the holding of the FWC. Finally, ANOVA indicated that players in the first quartile had a significantly higher mean age than those in the third quartile ($p < 0.01$, small) and fourth quartile ($p < 0.001$, small).

Table 2.
ANOVA analyses of FIFA World Cup players from 1998 to 2018

CATEGORY	VARIABLE	AGE	Statistical differences
		M \pm SD	
Number of Participations	1	25.2 \pm 3.6	
	2	27.9 \pm 3.2	vs 1: 0.75 (moderate)***
	3	30.2 \pm 2.4	vs 1: 1.4 (large)***/ vs 2: 0.72 (moderate)***
	4	32.6 \pm 2.9	vs 1: 2.05 (very large)***/ vs 2: 1.47 (large)***/ vs 3: 1 (moderate)*
	5	37 \pm 1.4	vs 1: 3.28 (extremely large)***/ vs 2: 2.84 (very large)**
Club Confederation	UEFA	26 \pm 3.8	
	CONMEBOL	26.5 \pm 3.8	vs CAF: 0.42 (small)*
	CONCACAF	27.1 \pm 4.2	vs UEFA: 0.29 (small)***/ vs CAF: 0.58 (small)***/ vs AFC: 0.29 (small)**
	CAF	24.9 \pm 3.8	
	AFC	26 \pm 3.8	
National Team Confederation	OFC	28.5 \pm 2.7	
	UEFA	26.3 \pm 3.8	vs CAF: 0.34 (small)***
	CONMEBOL	26.3 \pm 3.6	vs CAF: 0.34 (small)***
	CONCACAF	26.7 \pm 4	vs CAF: 0.44 (small)***/ vs AFC: 0.25 (small)**
	CAF	25 \pm 3.8	
Paying Position	AFC	25.8 \pm 3.5	vs CAF: 0.21 (small)***
	OFC	26.2 \pm 5.3	
	GK	28.9 \pm 4.3	vs CB: 0.62 (moderate)***/ vs FB: 0.88 (moderate)***/ vs CM: 0.83 (moderate)***/ vs W: 1.11 (moderate)***/ vs F: 0.81 (moderate)***
	CB	26.6 \pm 3.7	vs FB: 0.2 (small)*/ vs CM: 0.19 (trivial)**/ vs W: 0.47 (small)***/ vs F: 0.21 (small)***
	FB	25.9 \pm 3.4	vs W: 0.28 (small)***
Team Performance	CM	25.9 \pm 3.6	vs W: 0.28 (small)***
	W	24.9 \pm 3.6	
	F	25.8 \pm 3.8	vs W: 0.25 (small)**
	Winners	25.4 \pm 3.4	
	Final	26.9 \pm 3.5	vs Winners: 0.44 (small)*
FWC Year Celebration	Semifinal	25.7 \pm 3.8	
	Quarterfinal	26.1 \pm 3.9	
	Eighthfinal	26.2 \pm 3.8	
	Group Phase	26.1 \pm 3.8	
	Quartile Minutes Played	1998	26 \pm 3.9
2002		26.2 \pm 3.8	
2006		26 \pm 3.7	
2010		25.9 \pm 3.8	
2014		25.9 \pm 3.8	
Quartile Minutes Played	2018	26.5 \pm 3.9	
	1	26.5 \pm 3.6	vs 3: 0.18 (trivial)** / vs 4: 0.22 (small)***
	2	26.1 \pm 3.9	
	3	25.8 \pm 3.8	
	4	25.6 \pm 4	

Notes: GK: Goalkeepers; CB: Center Backs; FB: Fullbacks; CM: Center Midfielders; W: Wingers; F: Forward

*Significant level was set at $p < 0.05$ **Significant level was set at $p < 0.01$ ***Significant level was set at $p < 0.001$

The degree of influence of independent variables on age behaviour (AGE) are shown in Table 3. The variables that do not provide significant information in relation to age is the quartile minutes played and first FWC. Regarding to the variable's association degree, those with the highest level of association with age is the number of participations (0.389). On the other hand, the lowest levels of association are presented by the variables related to confederations (-0.164, 0.107). The higher number of participations in the competition increases the age, as well as the club confederation, while the selection confederation and the specific position decrease it.

Table 3.
The degree of influence of independent variables on age behaviour (AGE)

VARIABLES	COEFFICIENTS	p
Number of participation	0.389	0.000
Club confederation	0.107	0.000
National Team Confederation	-0.164	0.000
Playing position	-0.161	0.000
Team Performance	0.075	0.000
First FWC	0.034	0.325

Note: p: p value.

Discussion

The main aim of this study was to analyse the influence of age on variables such as the number of participations, national team confederation, club confederation, playing position, team performance, FWC year celebration, quartile minutes played, and age groups during FWC from 1998 to 2018. This is the first study that analyse the influence of age on the aforementioned variables during FWC tournaments in soccer. The obtained results showed that the age of the players ranged from 16 to 44 years, being the mean, mode, and median age 26 years. From 28 years onward, there is a substantial yearly decrease in the number of players. In addition, 92.4% of participants were aged between 21-30 years. ANOVA indicated that national teams (25 years) and clubs (24.9 years) belonging to the CAF have significantly younger players. For the playing position, it was observed that GK (28.9 years) and CB (26.6 years) have significantly older average ages than the other positions. W (24.9 years) is the position with the youngest players. Regarding the number of participations, the more participations the older the players are. On the other hand, it was observed that the winners (25.4 years) have lower average ages than the finalist (26.9 years). Regarding the evolution of age throughout the FWC year celebration, no significant differences were observed. Finally, the players who play the most minutes (Q1) have significantly higher average ages (26.5 years) than the rest of the players. Linear regression indicated that all independent variables except the quartile of minutes played and the first participation had an influence on AGE.

During the FWC tournaments played from 1998 to 2018, the mean, mode, and median age was 26 years. Similar to these findings, Kalén et al. (2019) pointed out that in the last three decades of the UCL there was an aging trend with an increase in age from 24.9 to 26.5 years. However, in this study, this trend does not occur, remaining stable the

age in the last six editions of the FWC as the age evolved from 26 to 26.5 years between the 1998 FWC and the 2018 FWC. Furthermore, it is worth noting that in both UCL 2018 (Kalén et al., 2019) and FWC 2018 the average age was 26.5 years. Another finding similar to Kalén et al. (2019) was that there was a substantial drop in the number of soccer players from the age of 28 in the FWC while in the UCL from the age of 29. Conversely to our results, Dendir (2016) concluded that the average age of the teams participating in the FWC 2010-2014 was 27.5 and 27.37 respectively. However, Dendir (2019) analysed all players called up for the FWC, while this study only considered those who participated for at least 1 min. Contrary to these findings, Oterhals et al. (2021) studied the age of soccer players when they were nominated for major individual awards worldwide, and observed that the age of peak individual performance in soccer was around 27-28 years, varying between playing positions from 26 to 31 years (Oterhals et al., 2021).

Similar to previous studies (Dendir, 2016; Kalén et al., 2019), most of the players (92.4% of the participants) were between 21-30 years old. Furthermore, these results indicated that 72.8% of the soccer players only participated on one occasion. Of the remaining 27.2%, 21% were those who participated twice. ANOVA showed that the average age of the one-time participants was 25.2 years while the average age of the two-time participants was 27.9 years. Furthermore, it was observed that professional soccer players with mean ages above 30 years were those who had participated on more than two occasions. This may be because soccer players who continue competing at the highest level can compensate for their physical condition decrement derived from age by improving other skills and enhancing technical-tactical performance (Rey et al., 2022; Sal de Rellán-Guerra et al., 2019). It has previously been shown that despite physical deterioration, older players (>30 years) make more successful passes, make better decisions, and have better intelligence in the game (Bradbury, 2009; Rampinini et al., 2009; Rey et al., 2022; Sal de Rellán-Guerra et al., 2019). Allen and Hopkins (2015) found that cognitive skills increase until the age of 60, accumulating experience. Following this topic, the linear regression showed that the number of participations in FWC was the variable with the highest degree of association with AGE, so that the higher the number of participations, the higher the age. In their study, Carapinha et al. (2019) concluded that professional soccer players retire between the ages of 31-35 years, and that their professional career lasts between 8-11 years.

The finding of this study indicates that 75.8% of the participating players come from UEFA clubs, while the remaining 24.14% come from other confederations. Furthermore, the average age of players playing for UEFA clubs was 26 years, coinciding with the age mean of this study and APP according to Dendir (2016) and Kalén et al. (2019). Additionally, CAF had the youngest players while CONCACAF had the oldest. Furthermore, in terms of club

confederation, the same was true, CAF had the youngest players while CONCACAF had the oldest. These results are consistent with Wong et al. (2008) in FWC 2002 and 2006 and Tuo et al. (2019) in FWC 2018. These last authors showed that CAF players were the youngest and least experienced while CONCACAF players were the oldest and most experienced. The main explanation for these findings is that the style of play in Africa was characterised by high speed and high intensity, so younger players performed better (Wong et al., 2008). These findings are closely related to those of previous studies (Gelade & Dobson, 2007; Lago-Peñas et al., 2019; Milanovic, 2005; Poli et al., 2022). On the other hand, it is worth noting that UEFA is the confederation with the highest participation of national teams (45%), followed by CONMEBOL and CAF with 16.1% each. Furthermore, the teams belonging to UEFA and CONMEBOL, and therefore the most successful to date in the FWC (www.fifa.com), share an average age of 26.3 years. Again, these results seem to indicate that the APP in professional soccer players is around 26 years (Dendir, 2016; Kalén et al., 2019). Despite these findings, more research is needed on match performance and AGE in the different confederations.

In recent years, several studies have analysed the peak performance regarding the different playing positions (Altmann et al., 2020; Dendir, 2016; Kalén et al., 2019; Oterhals et al., 2021; Sal de Rellán-Guerra et al., 2019). All of them concluded that the APP differs between them, mainly due to the different physical demands that players must support attending to their role during matches. The results obtained in this study agree with those reported in previous studies, showing that GK and CB have significantly older mean ages than the rest of the positions. In this sense, Kalén et al. (2019) argued that this could be due to the physical demands of GK and CB being lower compared to the other playing positions, and therefore, they can reach their maximum level at a higher age and maintain it for longer. Conversely, W ($24,9 \pm 3,6$) is the playing position with lower average ages. These results are also in line with Kalén et al. (2019) at UCL, which could be explained by the fact that W is the playing position that performs a greater number of sprints, a greater sprint distance, high and very high-intensity actions (Kalén et al., 2019; Modric et al., 2022; Mohr et al., 2003).

Being able to estimate what is the perfect age to win a FWC could be of great interest to federations and coaching staff when selecting the right players. In this sense, significant differences were observed in the average age between winners and finalists. A prior study conducted by Dendir (2016) concluded that a one-year increase in the average age of a team in the FWC results in a four-place drop in the final result. Contrary to these findings, Kalén et al. (2019) found no significant differences between the final score of teams competing in the UCL. These differences between FWC and UCL could be explained by the fact that teams participating in the UCL have players from all over the world while in the FWC only players from their own country,

therefore the differences between the teams participating in the UCL may be smaller.

Total minutes played has been previously used as an indicator of performance in professional soccer players (Caley, 2013; Dendir, 2016; M. Á. Gómez et al., 2019; Longo et al., 2019), furthermore, it would be pertinent to point out that the best soccer players play a big number of minutes (Dendir, 2016). The results obtained in this study indicated that the players who participated in a higher percentage of minutes (Q1) are those with a higher average age. These results support those previously obtained by Caley, (2013) and Dendir (2016).

Despite the promising results, this study is not without limitations that must be awarded by practitioners. Firstly, the individual performance of soccer players was not considered, so some players might have above or below-average performance ages. Secondly, it was not analysed how many top-level players for their national team did not participate due to injury or suspension. Thirdly, extraneous variables that could influence the final result were not considered (Gómez et al., 2013), or situational variables (e.g., scoring the first goal) (Caballero et al., 2017; Fernández-Cortés Tolosa et al., 2022). Future research lines should analyse why some professional soccer players maintain their above-average performance and why they can perform at the highest level at higher ages. For this reason, it would be interesting to analyse individual physical performance taking into account age over the different editions of the FWC. In addition, other qualitative variables that may influence the age of professional soccer players should be considered (e.g., group cohesion) (López-Gajardo et al., 2022). Lastly, since the FWC 2022 takes place at a different time of the year, it would be interesting to analyse how this influences the selection of the players to be selected. These results provide useful information regarding at what age players reach their peak performance and could provide valuable information to national federations and national team coaching staff to assist in decisions regarding player list management. Regarding age, the average age of participation in the FWC is 26 years, with GK and CB being the playing positions with the highest average age while W has the lowest average age. CM is the playing position with the highest participation, so it seems that the players playing in midfield are the ones who can bring experience to the rest of the national team.

Conclusion

In conclusion, the findings of the present study highlight the influence of age on performance in soccer. Specifically, age seems to have direct effects on the different playing positions, with those with the highest ages being GK and CB versus W representing the youngest players. In addition to age, another variable that seems to significantly influence the final result of the game is the membership of the different confederations, specifically UEFA, being the confederation with the highest number of participants.

Regarding to other variables such as participation in the tournament, they provided some findings such as that the winners have a lower average age than the finalists and that the players who play more minutes are significantly older than the rest of the players.

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