# Match Performance Profiles of Goalkeepers of Elite Football Teams

by

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# Match Performance Profiles of Goalkeepers of Elite Football Teams

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**ABSTRACT:**
The aim of the current study was to examine match performance of elite goalkeepers considering three situational variables (opposition, outcome and location). Match performance statistics of 46 goalkeepers who played 744 full matches during season 2012-13 in the Spanish First Division Professional Football League were analyzed. Results indicated that there were only three performance indicators (Fouls Drawn, Fouls Committed and Tackles) that showed no differences among goalkeepers of high, intermediate and low levels of team. The sole indicator was Saves which differed for goalkeepers of all three team levels and also the sole varied indicator for goalkeepers of intermediate and low level teams when facing different opponent levels. High level team goalkeepers showed differences in none of their match performance indicators during matches won, drawn and lost. However, Saves ($F_{2,244}$=6.459, $p<0.01$, $\eta_p^2$=0.05) was the sole indicator which differed for low level team goalkeepers when the final outcome is different. Different variations in performance indicators were found depending on the match location for different team levels. The most interesting performance differential was that a goalkeeper of a high-level team had a higher number of Saves when playing against a low-level team than a high-level team or an intermediate-level team. Information provided by the profiles can be used by coaches to modify training programs depending on the game context of upcoming matches. Results can also enable a more thorough understanding of goalkeeper's performance profiles from different team levels, thus can be used for talent identification and player selection in the transfer market.

**Key words:** Association Football, Performance Analysis, Soccer, Sport Analytics

## INTRODUCTION

The goalkeeper is a unique position in football teams, and it is considered to be a determinant

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on the final match outcome, because one single mistake made by a goalkeeper can lead to a change on the scoreboard [1]. Consequently, it is extremely important to evaluate a goalkeeper's match performance so that training programs can be designed and modified appropriately [2]. However, additional studies should be undertaken in order to increase the knowledge of goalkeeper match performance.

Di Salvo et al. [2] analyzed the distance covered at different categories of intensity during the first and second half of the match by goalkeepers from teams of the English Premier League. Most of a goalkeeper's movement during a match is done at walking or at low intensity speeds, and that there were few high intensity actions. Similar results were found in non-professional goalkeepers [3]. As stated by Di Salvo et al. [2], it is necessary to take the technical skills and the final match results into consideration when analyzing a goalkeeper's match performance.

For a long time, defending against a penalty kick has been the main object of studies [4-11], despite the fact that penalty kicks are a rare occurrence in a match [1]. To our knowledge, few studies have focused on technical and tactical goalkeeper performance [1, 12-14]. Nonetheless, previous studies did not consider the influence of situational variables (i.e., level of player/team/opposition, match outcome, game location, match period, etc.). However, as it has been verified that the technical and tactical performance of footballers and/or teams is influenced by situational variables [15-19]. Therefore, studies should consider the influence of these variables on goalkeeper's performance.

The aim of the current study was to introduce the profiling technique developed by O'Donoghue [20, 21] to analyze technical and tactical performance of goalkeepers from different team levels in the Spanish First Division Professional Football League. Three situational variables were considered: opposition, outcome and game location. According to previous studies [18, 19, 22, 23], it has been hypothesized that goalkeepers of high level teams performed better than those of intermediate and low level teams and that goalkeepers of different team levels showed differential performance under different situational conditions.

## METHOD

### SUBJECT AND SAMPLE

Subjects of the current study consisted of all goalkeepers who started and played at least one entire match during the season 2012-2013 in the Spanish First Division Professional Football League (*La Liga BBVA*). Substitutes and the players they substituted were excluded, which finally limited the subjects to 46 goalkeepers (age: 29.0 ± 4.4 years, height: 187.0 ± 4.5 cm, weight: 81.4 ± 4.7 kg)[1] who played 744 full matches.

### DATA SOURCE AND RELIABILITY

Statistics used in the study were made available by OPTA Sportsdata Spain Company (Madrid). The reliability of tracking system (*OPTA Client System*) has been verified by Liu et al. [24] which showed a high level of inter-operator reliability using the system to track goalkeeper's match actions (weighted kappa for two tested goalkeepers: 0.86 and 0.92). The Company maintained the anonymity of players and teams following European Data Protection Law. Ethics committee approval was obtained from the Non-experimental Review Board at Faculty of Physical Activity and Sport Sciences at Polytechnic University of Madrid.

[1] Retrieved from the official website of Spanish Professional Football League (www.lfp.es) on the date of 22nd, June, 2013

## VARIABLES

Based on the review and analysis of available literature in the performance analysis of football [13, 14, 16, 22-24], the following fifteen match performance indicators were chosen for analyses:

- *Ball Touch* (BT): A sum of all events where the goalkeeper touches the ball.
- *Pass*: An intentional played ball from the goalkeeper to his teammate, including ball throwing from the hand.
- *Pass Accuracy (%)* (PA): A ratio calculated from successful passes divided by all passes.
- *Pass to Forward Half* (PtFH): A pass to the opponent's half of the pitch made by the goalkeeper.
- *Accuracy of Pass to Forward Half (%)* (AoPtFH): A ratio calculated from successful passes to the opponent's half of pitch divided by all the attempted passes to the opponent's half.
- *Foul Drawn* (FD): Where the goalkeeper is fouled by an opponent.
- *Interception*: A goalkeeper intercepts a pass with some movement (from any part of his body) or reading of the play.
- *Clearance*: Attempt made by the goalkeeper to get the ball out of the danger zone, when there is pressure (from opponents) on him to clear the ball from the danger zone.
- *Foul Committed* (FC): Any infringement committed by the goalkeeper that is penalised as foul play by a referee.
- *Yellow Card* (YC): Where the goalkeeper is booked by the referee due to illegal actions.
- *Tackle*: Act of gaining possession from an opposition player who is in possession of the ball.
- *Ball Recovery* (BR): The event given at the start of a goalkeeper's recovery of ball possession from opponents from open play.
- *Save*: The goalkeeper prevents the ball from entering the goal with any part of his body.
- *Catch*: The goalkeeper catching a cross or a ball played in to the area when there is pressure from an opposition player asserted on him.
- *Lost Ball* (LB): The goalkeeper lost ball possession due to a mistake/poor control, including turnovers, dispossesses and unsuccessful passes.

Meanwhile, the following three situational variables were also analyzed:

1) Qualities of the team and of its opposition (high, intermediate and low level team). The quality of a team was classified into three groups using a k-means cluster analysis [15, 25, 26]:
   a) High level teams (end of season ranking: 3.51 ± 1.70, ranged from 1 to 6, 225 match participations);
   b) Intermediate level teams (end of season ranking: 10.01 ± 2.00, ranged from 7 to 13, 260 match participations);
   c) Low level teams (end of season ranking: 16.97 ± 2.01, ranged from 14 to 20, 259 match participations).
2) Match outcome (win, draw and loss);
3) Game location (home and away).

### STATISTICAL ANALYSIS

The first step of the current study was to identify the overall performance of goalkeepers from three different levels of teams by presenting the performance indicators' means ± standard deviations (SD), medians, lower and upper quartiles to represent their typical performances and spreads. Meanwhile, their means were compared by using a one-way ANOVA analysis of variance. Secondly, all the performance indicators (dependent variables) of all the goalkeepers were transferred into standardized score (Z-Score, Z), and were unified into the same scale using the formulation "T=20Z+50" [27]. O'Donoghue [20, 21] suggested using the medians of performance indicators of tennis players to set up their performance profiles. However, due to the specific nature of football goalkeepers' performance data, the median sometimes cannot represent their differences in performance (i.e., there were only two values of "yellow cards" (0, 1), the median was 0 for all goalkeepers from all levels of teams under all situational conditions). Therefore, the current study plotted the means of transferred scores of all performance indicators of team goalkeeper performances. Lastly, different levels of teams' goalkeepers' performances at different situational conditions (i.e., when versus different oppositions, match outcomes of win, draw and loss, playing at home and away) were analyzed by the same procedure (differences of playing at home and away were compared using an Independent Sample T test.). A K-means cluster analysis, a one-way ANOVA analysis of variance (multiple comparison was assessed with a *Scheffé* post-hoc test) and an independent sample t test were all performed using the data package of IBM SPSS 20.0 Statistics (Chicago, USA). Significances were set to $p = 0.05$.

## RESULTS

### OVERALL PERFORMANCES OF GOALKEEPERS FROM DIFFERENT LEVELS OF TEAMS

The typical performances of goalkeepers from different team levels were presented in Table 1. As can be seen, there were only three performance indicators (FD ($F_{2, 741} = 0.515, p>0.05$), FC ($F_{2, 741} = 0.775, p>0.05$) and tackles ($F_{2, 741} = 0.494, p>0.05$) which did not differ for goalkeepers of various team levels.

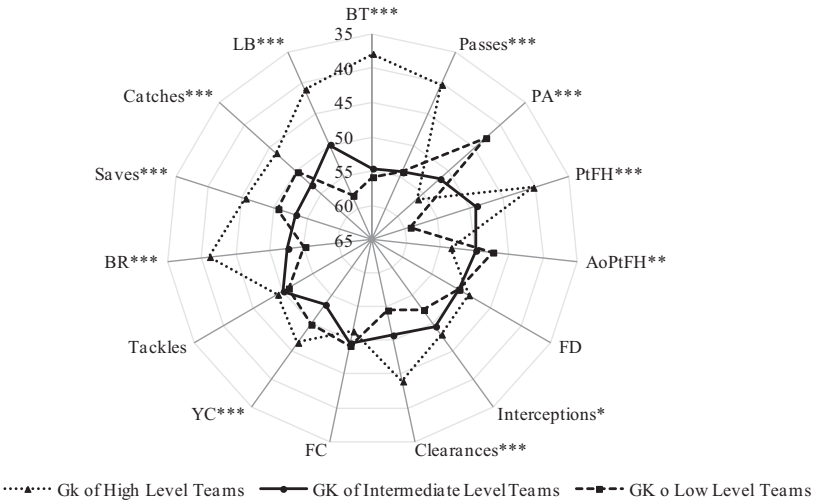


Figure 1. Overall performance profiles of goalkeepers of high, intermediate and low level teams

Goalkeepers of high level teams achieved less BT, Passes, Clearances, BR and Saves than those of intermediate and low level teams, while no differences were found between goalkeepers of the latter two levels in these indicators. The indicators of PA, PtFH and LB were those that differed among goalkeepers of all three team levels. Meanwhile, goalkeepers of high level teams accomplished less YC ($p<0.001$) and Catches ($p<0.001$) than those of intermediate level teams. Finally, high level teams' goalkeepers achieved higher AoPtFH ($p<0.01$) but fewer Interceptions ($p<0.05$) than for low level teams (see Figure 1).

## PERFORMANCE PROFILES WHEN FACING DIFFERENT QUALITIES OF OPPOSITIONS

As presented in Table 2, indicators PA ($F_{2, 220}=3.864$, $\eta_p^2=0.034$, $p<0.05$), FC ($F_{2, 220}=3.605$, $\eta_p^2=0.031$, $p<0.05$), BR ($F_{2, 220}=3.967$, $\eta_p^2=0.034$, $p<0.05$) and Saves ($F_{2, 206}=3.269$, $\eta_p^2=0.031$, $p<0.05$) were those that differed for goalkeepers of high level teams in matches when facing different opponent levels. While for goalkeepers of intermediate and low level teams, only the indicator of Saves (intermediate: $F_{2, 246}=5.305$, $\eta_p^2=0.041$, $p<0.01$; low: $F_{2, 244}=8.209$, $\eta_p^2=0.063$, $p<0.001$) were different when facing different opponent levels.

High level team Goalkeepers achieved lower PA ($p<0.05$) and less BR ($p<0.05$) when facing high level teams than when facing low level teams. They also made more FC when facing high level teams than when facing intermediate ($p<0.05$) and low ($p<0.05$) level teams. However, high level team goalkeepers accomplished more Saves when facing low level teams than when facing high ($p<0.05$) and intermediate ($p<0.05$) level teams. While goalkeepers of intermediate and low level teams made more Saves when facing high level teams than when facing intermediate and low level teams (See Figure 2).

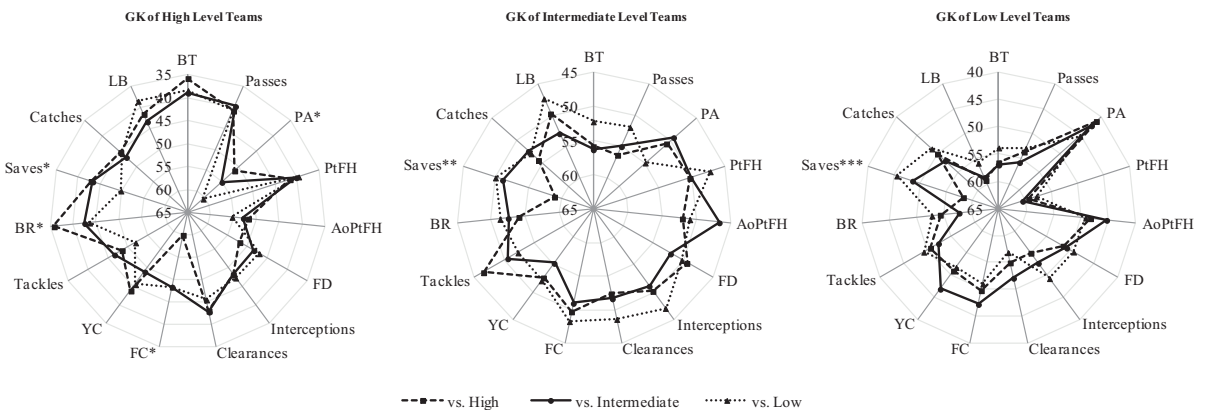


Figure 2. Performance profiles of goalkeepers of high, intermediate and low level teams when facing different levels of oppositions

## PERFORMANCE PROFILES WHEN ENDING WITH DIFFERENT MATCH OUTCOMES

As can be seen in Table 3, there were no differences for goalkeepers of high level teams in matches ending with different match outcomes. Five differences were detected for goalkeepers of intermediate level teams during their performances in matches won, drew and lost. The differed indicators were PA ($F_{2, 257}=4.326$, $\eta_p^2=0.033$, $p<0.05$), PtFH ($F_{2, 257}=6.849$, $\eta_p^2=0.051$, $p<0.01$), FD ($F_{2, 257}=4.300$, $\eta_p^2=0.032$, $p<0.05$), Catches ($F_{2, 257}=5.947$, $\eta_p^2=0.044$, $p<0.01$) and LB ($F_{2, 257}=5.281$, $\eta_p^2=0.039$, $p<0.01$). While for goalkeepers of low level teams, only the indicator of Saves ($F_{2, 244}=6.459$, $\eta_p^2=0.050$,

Table1. Descriptive statistics of overall performances of goalkeepers from different levels of teams

| Performance Indicators | GK of High Level Teams | | | | GK of Intermediate Level Teams | | | | GK of Low Level Teams | | | | ANOVA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean ± SD | Median | Lower Quartile | Upper Quartile | Mean ± SD | Median | Lower Quartile | Upper Quartile | Mean ± SD | Median | Lower Quartile | Upper Quartile | df | F | Sig. | $\eta_p^2$ |
| BT | 35.3 ± 10.3 | 35 | 27 | 41 | 44.2 ± 9.8 | 43.5 | 37 | 51 | 44.8 ± 9.3 | 44 | 38 | 51 | 2, 741 | 70.160 | *** | 0.159 |
| Passes | 15.5 ± 6.1 | 15 | 11 | 19 | 20.0 ± 6.6 | 19 | 16 | 24 | 19.9 ± 5.6 | 20 | 16 | 23 | 2, 741 | 42.226 | *** | 0.102 |
| PA | 58.9 ± 18.7 | 58 | 46 | 73 | 54.8 ± 19.5 | 55 | 41 | 69 | 46.5 ± 15.6 | 46 | 36 | 55 | 2, 741 | 30.643 | *** | 0.076 |
| PtFH | 7.9 ± 5.9 | 8 | 3 | 11 | 10.7 ± 5.8 | 11 | 7 | 15 | 13.9 ± 6.2 | 14 | 10 | 18 | 2, 741 | 62.813 | *** | 0.145 |
| AoPtFH | 38.1 ± 19.6 | 34.3 | 25 | 50 | 35.1 ± 16.0 | 33.3 | 25 | 43.4 | 33.1 ± 14.2 | 31.6 | 21.7 | 42.9 | 2, 682 | 5.130 | ** | 0.015 |
| FD | 0.1 ± 0.3 | 0 | 0 | 0 | 0.1 ± 0.4 | 0 | 0 | 0 | 0.1 ± 0.3 | 0 | 0 | 0 | 2, 741 | 0.515 | | 0.001 |
| Interceptions | 0.0 ± 0.2 | 0 | 0 | 0 | 0.1 ± 0.3 | 0 | 0 | 0 | 0.1 ± 0.3 | 0 | 0 | 0 | 2, 741 | 3.144 | * | 0.008 |
| Clearances | 0.1 ± 1.0 | 1 | 0 | 2 | 1.4 ± 1.3 | 1 | 0 | 2 | 1.6 ± 1.5 | 1 | 1 | 2 | 2, 741 | 17.909 | *** | 0.046 |
| FC | 0.0 ± 0.3 | 0 | 0 | 0 | 0.0 ± 0.2 | 0 | 0 | 0 | 0.0 ± 0.1 | 0 | 0 | 0 | 2, 741 | 0.775 | | 0.002 |
| YC | 0.0 ± 0.2 | 0 | 0 | 0 | 0.1 ± 0.3 | 0 | 0 | 0 | 0.1 ± 0.3 | 0 | 0 | 0 | 2, 741 | 7.196 | *** | 0.019 |
| Tackles | 0.0 ± 0.2 | 0 | 0 | 0 | 0.0 ± 0.2 | 0 | 0 | 0 | 0.0 ± 0.2 | 0 | 0 | 0 | 2, 741 | 0.494 | | 0.001 |
| BR | 8.4 ± 3.2 | 8 | 6 | 10 | 10.6 ± 4.0 | 10 | 8 | 13 | 11.0 ± 3.4 | 11 | 8 | 13 | 2, 741 | 36.013 | *** | 0.088 |
| Saves | 2.9 ± 1.8 | 3 | 2 | 4 | 3.7 ± 1.9 | 3 | 2 | 5 | 3.4 ± 2.1 | 3 | 2 | 5 | 2, 702 | 8.791 | *** | 0.024 |
| Catches | 1.1 ± 1.3 | 1 | 0 | 2 | 1.6 ± 1.5 | 1 | 1 | 2 | 1.4 ± 1.2 | 1 | 0 | 2 | 2, 741 | 7.581 | *** | 0.020 |
| LB | 10.7 ± 6.3 | 9 | 6 | 15 | 13.7 ± 6.6 | 13 | 9 | 18 | 16.4 ± 6.2 | 16 | 12 | 20 | 2, 741 | 49.010 | *** | 0.117 |

*Note1: *p<0.05, **p<0.01, ***p<0.001*

*Note2: BT = Ball Touches, PA = Pass Accuracy (%), PtFH = Passes to Forward Half, AoPtFH = Accuracy (%) of Passes to Forward Half, FD = Fouls Drawn, FC = Fouls Committed, YC = Yellow Cards, BR = Ball Recoveries, LB = Lost Balls.*

Table 2. Descriptive statistics of performances of goalkeepers from high, intermediate and low level teams when facing different levels of oppositions

| Performance Indicators | GK of High Level Teams | | | | | | | GK of Intermediate Level Teams | | | | | | | GK of Low Level Teams | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | vs. High | vs. Interm. | vs. Low | ANOVA | | | | vs. High | vs. Interm. | vs. Low | ANOVA | | | | vs. High | vs. Interm. | vs. Low | ANOVA | | | |
| | Mean ± SD | Mean ± SD | Mean ± SD | df | F | Sig. | $\eta_p^2$ | Mean ± SD | Mean ± SD | Mean ± SD | df | F | Sig. | $\eta^2$ | Mean ± SD | Mean ± SD | Mean ± SD | df | F | Sig. | $\eta_p^2$ |
| BT | 34.1 ± 10.6 | 35.8 ± 9.3 | 35.5 ± 11.0 | 2, 222 | 0.501 | | 0.004 | 44.8 ± 9.3 | 45.0 ± 10.4 | 42.9 ± 9.6 | 2, 257 | 1.347 | | 0.010 | 45.2 ± 9.1 | 45.4 ± 9.9 | 43.8 ± 8.8 | 2, 256 | 0.802 | | 0.006 |
| Passes | 15.5 ± 6.1 | 15.3 ± 6.3 | 15.6 ± 6.1 | 2, 222 | 0.078 | | 0.001 | 20.6 ± 7.9 | 20.2 ± 6.1 | 19.2 ± 5.7 | 2, 257 | 1.112 | | 0.009 | 19.8 ± 4.9 | 20.4 ± 6.1 | 19.5 ± 5.6 | 2, 256 | 0.642 | | 0.005 |
| PA | 54.4 ± 17.0 | 57.9 ± 18.9 | 63.0 ± 19.1 | 2, 222 | 3.864 | * | 0.034 | 53.8 ± 19.5 | 52.5 ± 17.9 | 57.7 ± 20.7 | 2, 257 | 1.734 | | 0.013 | 44.9 ± 14.5 | 46.0 ± 14.4 | 48.6 ± 16.8 | 2, 256 | 1.276 | | 0.010 |
| PtFH | 8.5 ± 6.2 | 7.8 ± 5.7 | 7.6 ± 5.9 | 2, 222 | 0.196 | | 0.002 | 11.0 ± 5.7 | 11.0 ± 5.8 | 10.0 ± 5.8 | 2, 257 | 0.899 | | 0.007 | 14.0 ± 6.4 | 14.3 ± 6.4 | 13.5 ± 6.0 | 2, 256 | 0.402 | | 0.003 |
| AoPtFH | 36.6 ± 18.1 | 37.6 ± 19.8 | 39.7 ± 20.5 | 2, 187 | 0.367 | | 0.004 | 36.8 ± 16.9 | 32.3 ± 14.6 | 35.9 ± 16.0 | 2, 241 | 1.706 | | 0.014 | 33.7 ± 14.0 | 31.3 ± 13.2 | 34.5 ± 15.3 | 2, 248 | 1.211 | | 0.010 |
| FD | 0.2 ± 0.4 | 0.1 ± 0.3 | 0.1 ± 0.3 | 2, 222 | 1.291 | | 0.011 | 0.1 ± 0.3 | 0.2 ± 0.4 | 0.1 ± 0.4 | 2, 257 | 0.334 | | 0.003 | 0.1 ± 0.4 | 0.1 ± 0.4 | 0.1 ± 0.3 | 2, 256 | 0.255 | | 0.002 |
| Interceptions | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.2 | 2, 222 | 0.117 | | 0.001 | 0.1 ± 0.4 | 0.1 ± 0.3 | 0.0 ± 0.1 | 2, 257 | 0.956 | | 0.007 | 0.1 ± 0.4 | 0.1 ± 0.3 | 0.0 ± 0.2 | 2, 256 | 1.196 | | 0.009 |
| Clearances | 0.9 ± 1.1 | 0.9 ± 0.9 | 1.1 ± 0.9 | 2, 222 | 0.833 | | 0.007 | 1.5 ± 1.4 | 1.5 ± 1.2 | 1.3 ± 1.3 | 2, 257 | 0.949 | | 0.007 | 1.7 ± 1.4 | 1.5 ± 1.4 | 1.8 ± 1.7 | 2, 256 | 1.000 | | 0.008 |
| FC | 0.1 ± 0,5 | 0.0 ± 0.1 | 0.0 ± 0.1 | 2, 222 | 3.605 | * | 0.031 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.1 | 2, 257 | 0.672 | | 0.005 | 0.0 ± 0.2 | 0.0 ± 00 | 0.0 ± 0,2 | 2, 256 | 1.656 | | 0.013 |
| YC | 0.0 ± 0.0 | 0.1 ± 0.3 | 0.0 ± 0.2 | 2, 222 | 2.829 | | 0.025 | 0.1 ± 0.3 | 0.2 ± 0.4 | 0.1 ± 0.3 | 2, 257 | 0.413 | | 0.003 | 0.1 ± 0.3 | 0.0 ± 0.2 | 0.1 ± 0.3 | 2, 256 | 1.625 | | 0.013 |
| Tackles | 0.0 ± 0.1 | 0.0 ± 0.0 | 0.0 ± 0.3 | 2, 222 | 1.594 | | 0.014 | 0.0 ± 0.0 | 0.0 ± 0.2 | 0.1 ± 0.2 | 2, 257 | 2.089 | | 0.016 | 0.0 ± 0.2 | 0.1 ± 0.2 | 0.0 ± 0.2 | 2, 256 | 0.471 | | 0.004 |
| BR | 7.4 ± 2.9 | 8.7 ± 2.8 | 8.9 ± 3.6 | 2, 222 | 3.967 | * | 0.034 | 10.8 ± 4.0 | 10.5 ± 4.2 | 10.3 ± 3.8 | 2, 257 | 0.375 | | 0.003 | 10.9 ± 3.5 | 11.5 ± 3.8 | 10.6 ± 3.0 | 2, 256 | 1.735 | | 0.013 |
| Saves | 2.7 ± 1.8 | 2.7 ± 1.5 | 3.3 ± 2.0 | 2.206 | 3.269 | * | 0.031 | 4.3 ± 2.2 | 3.5 ± 1.8 | 3.4 ± 1.7 | 2, 246 | 5.305 | ** | 0.041 | 4.2 ± 2.5 | 3.2 ± 1.8 | 2.9 ± 1,7 | 2, 244 | 8.209 | *** | 0.063 |
| Catches | 1.1 ± 1.4 | 1.2 ± 1.2 | 1.1 ± 1.4 | 2, 222 | 0.141 | | 0.001 | 1.7 ± 1.5 | 1.5 ± 1.5 | 1.6 ± 1.4 | 2, 257 | 0.186 | | 0.001 | 1.4 ± 1.1 | 1.5 ± 1.3 | 1.3 ± 1.2 | 2, 256 | 0.729 | | 0.006 |
| LB | 10.9 ± 6.1 | 11.5 ± 6.2 | 9.8 ± 6.4 | 2, 222 | 1.517 | | 0.013 | 13.6 ± 6.5 | 14.7 ± 6.5 | 12.8 ± 6.7 | 2, 257 | 1.834 | | 0.014 | 16.9 ± 5.9 | 16.7 ± 6.2 | 15.7 ± 6.6 | 2, 256 | 0.835 | | 0.006 |

*Note 1: *p<0.05, **p<0.01, ***p<0.001*

*Note 2: Lower and upper quartiles were removed due to table size limitations*

*Note 3: BT = Ball Touches, PA = Pass Accuracy (%), PtFH = Passes to Forward Half, AoPtFH = Accuracy (%) of Passes to Forward Half, FD = Fouls Drawn, FC = Fouls Committed, YC = Yellow Cards, BR = Ball Recoveries, LB = Lost Balls.*

Table 3. Descriptive statistics of performances of goalkeepers from high, intermediate and low level teams when ending with different match outcomes

| Performance Indicators | GK of High Level Teams | | | | | | | GK of Intermediate Level Teams | | | | | | | GK of Low Level Teams | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Loss | Draw. | Win | ANOVA | | | | Loss | Draw. | Win | ANOVA | | | | Loss | Draw. | Win | ANOVA | | | |
| | Mean ± SD | Mean ± SD | Mean ± SD | df | F | Sig. | $\eta_p^2$ | Mean ± SD | Mean ± SD | Mean ± SD | df | F | Sig. | $\eta_p^2$ | Mean ± SD | Mean ± SD | Mean ± SD | df | F | Sig. | $\eta_p^2$ |
| BT | 35.8 ± 8.3 | 36.2 ± 10.4 | 34.8 ± 10.8 | 2, 222 | 0.431 | | 0.004 | 43.1 ± 9.8 | 43.8 ± 10.1 | 45.7 ± 9.5 | 2, 257 | 1.866 | | 0.014 | 45.1 ± 9.5 | 43.4 ± 8.5 | 45.6 ± 9.6 | 2, 256 | 0.961 | | 0.007 |
| Passes | 15.8 ± 6.0 | 15.1 ± 5.9 | 15.5 ± 6.3 | 2, 222 | 0.133 | | 0.001 | 19.7 ± 7.2 | 20.0 ± 7.0 | 20.3 ± 5.4 | 2, 257 | 0.231 | | 0.002 | 20.3 ± 5.9 | 19.0 ± 5.3 | 20.1 ± 5.3 | 2, 256 | 1.198 | | 0.009 |
| PA | 56.8 ± 14.6 | 57.0 ± 20.1 | 60.3 ± 19.5 | 2, 222 | 0.915 | | 0.008 | 58.7 ± 19.5 | 50.4 ± 19.8 | 52.8 ± 18.7 | 2, 257 | 4.326 | * | 0.033 | 48.0 ± 15.8 | 47.1 ± 16.0 | 42.8 ± 14.3 | 2, 256 | 2.488 | | 0.019 |
| PtFH | 8.1 ± 4.9 | 7.8 ± 6,2 | 7.8 ± 6.2 | 2, 222 | 0.044 | | 0.000 | 9.2 ± 6.0 | 11.6 ± 6.2 | 11.9 ± 4.9 | 2, 257 | 6.849 | ** | 0.051 | 14.0 ± 6.4 | 12.9 ± 6.2 | 14.8 ± 5.9 | 2, 256 | 1.563 | | 0.012 |
| AoPtFH | 36.1 ± 17.1 | 34.2 ± 18.4 | 40.2 ± 20.7 | 2, 187 | 1.611 | | 0.017 | 35.8 ± 17.7 | 33.9 ± 13.7 | 35.0 ± 15,2 | 2.241 | 0.240 | | 0.002 | 33.9 ± 14.4 | 33.2 ± 16.1 | 31.4 ± 11.9 | 2, 248 | 0.654 | | 0.005 |
| FD | 0.1 ± 0.3 | 0.1 ± 0.4 | 0.1 ± 0.3 | 2, 222 | 1.205 | | 0.011 | 0.1 ± 0.3 | 0.1 ± 0.3 | 0.2 ± 0.5 | 2, 257 | 4.300 | * | 0.032 | 0.1 ± 0.4 | 0.1 ± 0.4 | 0.1 ± 0.3 | 2, 256 | 0.096 | | 0.001 |
| Interceptions | 0.0 ± 0.1 | 0.0 ± 0.2 | 0.0 ± 0.2 | 2, 222 | 0.161 | | 0.001 | 0.1 ± 0.4 | 0.0 ± 0,1 | 0.0 ± 0.2 | 2, 257 | 1.348 | | 0.010 | 0.1 ± 0.4 | 0.0 ± 0.2 | 0.1 ± 0.3 | 2, 256 | 0.698 | | 0.005 |
| Clearances | 0.8 ± 0.8 | 1.2 ± 1.0 | 0.9 ± 1.0 | 2, 222 | 1.587 | | 0.014 | 1.3 ± 1.2 | 1,4 ± 1.2 | 1.6 ± 1.5 | 2, 257 | 1.531 | | 0.012 | 1.7 ± 1.4 | 1.5 ± 1.5 | 1.7 ± 1.7 | 2, 256 | 0.404 | | 0.003 |
| FC | 0.1 ± 0.3 | 0.0 ± 0.0 | 0.0 ± 0.3 | 2, 222 | 0.743 | | 0.007 | 0.0 ± 0.2 | 0.0 ± 0.1 | 0.0 ± 0.1 | 2, 257 | 0.079 | | 0.001 | 0.0 ± 0.2 | 0.0 ± 0.0 | 0.0 ± 0.1 | 2, 256 | 1.048 | | 0.008 |
| YC | 0.0 ± 0.0 | 0.0 ± 0.1 | 0.1 ± 0.2 | 2, 222 | 1.535 | | 0.014 | 0.1 ± 0.3 | 0,1 ± 0.3 | 0.2 ± 0.4 | 2, 257 | 2.959 | | 0.023 | 0.1 ± 0.3 | 0.1 ± 0.3 | 0.1 ± 0.3 | 2, 256 | 0.421 | | 0.003 |
| Tackles | 0.0 ± 0.2 | 0.0 ± 0.3 | 0.2 ± 0.1 | 2, 222 | 1.127 | | 0.010 | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.0 ± 0.1 | 2, 257 | 0.972 | | 0.008 | 0.0 ± 0.2 | 0.0 ± 0.1 | 0.0 ± 0.2 | 2, 256 | 0.497 | | 0.004 |
| BR | 8.5 ± 2.6 | 9.3 ± 3.5 | 8.1 ± 3.2 | 2, 222 | 2.495 | | 0.022 | 10.4 ± 4.1 | 10.2 ± 3.5 | 10.9 ± 4.1 | 2, 257 | 0.594 | | 0.005 | 11.1 ± 3.5 | 10.6 ± 3.3 | 11.2 ± 3.6 | 2, 256 | 0.644 | | 0.005 |
| Saves | 3.0 ± 1.6 | 3.2 ± 2.0 | 2.8 ± 1.8 | 2, 206 | 0.640 | | 0.006 | 3.9 ± 2.1 | 3.5 ± 1.7 | 3.5 ± 1.9 | 2, 246 | 1.645 | | 0.013 | 3.9 ± 2.3 | 2.9 ± 1.8 | 2.9 ± 1.6 | 2, 244 | 6.459 | ** | 0.050 |
| Catches | 1.1 ± 1.3 | 1.1 ± 1.0 | 1.1 ± 1.4 | 2, 222 | 0.049 | | 0.000 | 1.2 ± 1.1 | 1.9 ± 1.6 | 1.9 ± 1.7 | 2, 257 | 5.947 | ** | 0.044 | 1.2 ± 1.2 | 1.7 ± 1.2 | 1.5 ± 1.3 | 2, 256 | 2.861 | | 0.022 |
| LB | 107 ± 5.0 | 10.7 ± 6.4 | 10.7 ± 6.7 | 2, 222 | 0.001 | | 0.000 | 12.2 ± 6.8 | 15.1 ± 6.7 | 14.6 ± 5.9 | 2, 257 | 5.281 | ** | 0.039 | 16.1 ± 6.4 | 16.0 ± 5.9 | 17.5 ± 6.3 | 2, 256 | 1.269 | | 0.010 |

*Note 1: *p<0.05, **p<0.01*

*Note 2: Lower and upper quartiles were removed due to table size limitations*

*Note 3: BT = Ball Touches, PA = Pass Accuracy (%), PtFH = Passes to Forward Half, AoPtFH = Accuracy (%) of Passes to Forward Half, FD = Fouls Drawn, FC = Fouls Committed, YC = Yellow Cards, BR = Ball Recoveries, LB = Lost Balls.*

*p<0.01*) differed from their performances in won, drawn and lost matches.

In lost matches, intermediate level team goalkeeper achieved fewer PtFH, Catches and LB than in the won and drawn ones, and fewer FD (*p<0.05*) than in won matches, but higher PA (*p<0.05*) than in drawn matches. Low level team goalkeeper made more Saves when the team lost when they won (*p<0.05*) or drew (*p<0.05*) (see Figure 3).

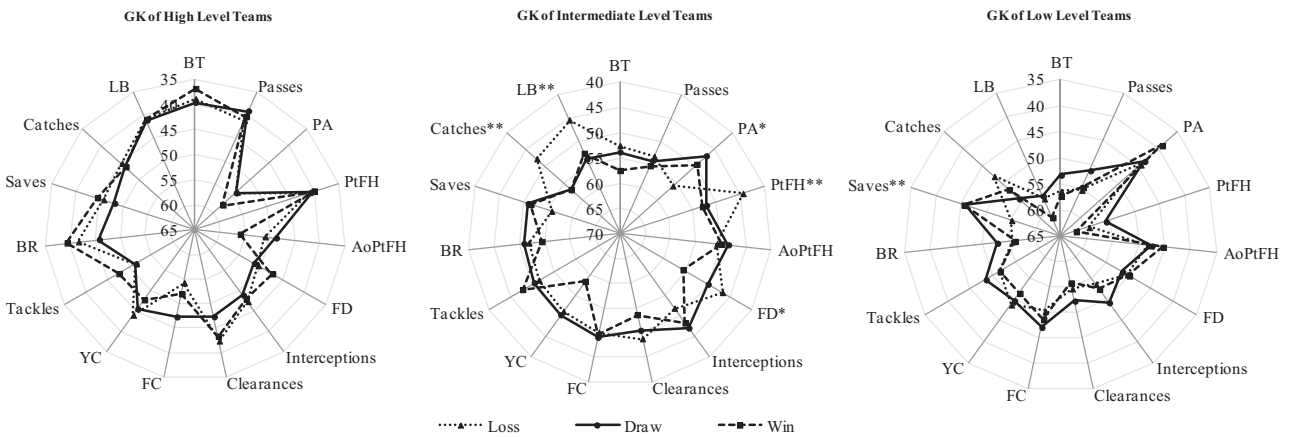


Figure 3. Performance profiles of goalkeepers of high, intermediate and low level teams in matches ending with different outcomes

## PERFORMANCE PROFILES WHEN PLAYING AT DIFFERENT LOCATIONS

High level team goalkeepers achieved higher PA ($t_{223}=3.660, p<0.001$), AoPtFH ($t_{177}=3.115, p<0.01$), and less LB ($t_{223}=3.282, p<0.01$) when playing at home than when playing away. In home matches of intermediate level teams, goalkeepers accomplished fewer BT ($t_{258}=3.712, p<0.001$), Clearances ($t_{245}=3.891, p<0.001$), YC ($t_{258}=3.421, p<0.001$), Saves ($t_{230}=3.828, p<0.001$), LB ($t_{258}=3.001, p<0.01$) and more PA ($t_{258}=2.311, p<0.05$) and AoPtFH ($t_{242}=2.529, p<0.05$) than in away matches. Low level team goalkeeper indicators of Clearances ($t_{257}=2.882, p<0.01$), Saves ($t_{245}=2.160, p<0.05$) and Catches ($t_{244}=2.688, p<0.01$) showed higher value when playing away than when playing at home (See Table 4 and Figure 4).

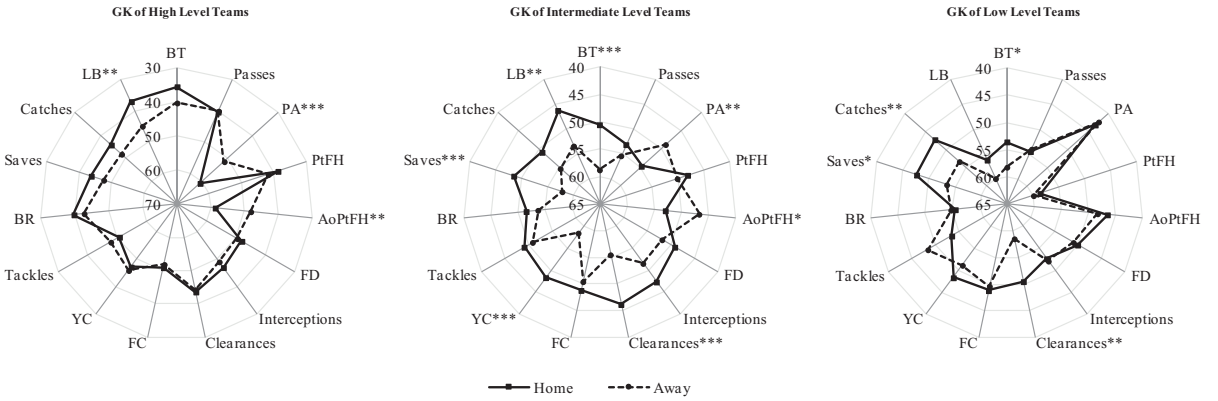


Figure 4. Performance profiles of goalkeepers of high, intermediate and low level teams when playing at home and away

Table 4. Descriptive statistics of performances of goalkeepers from high, intermediate and low level teams when playing at different locations

| Performance | GK of High Level Teams | | | | | GK of Intermediate Level Teams | | | | | GK of Low Level Teams | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Indicators | Home Mean ± SD | Away Mean ± SD | T | df | Sig. (2-tailed) | Home Mean ± SD | Away Mean ± SD | t | df | Sig. (2-tailed) | Home Mean ± SD | Away Mean ± SD | t | df | Sig. (2-tailed) |
| BT | 34.0 ± 9.9 | 36.6 ± 10.5 | 1.864 | 223 | | 42.0 ± 9.3 | 46.4 ± 9.8 | 3.712 | 258 | *** | 43.6 ± 8.9 | 46.1 ± 9.5 | 2.155 | 257 | * |
| Passes | 15.5 ± 6.1 | 15.4 ± 6.2 | 0.125 | 223 | | 19.6 ± 5.6 | 20.3 ± 7.5 | 0.886 | 258 | | 20.0 ± 5.9 | 19.9 ± 5.4 | 0.222 | 257 | |
| PA | 63.4 ± 19.0 | 54.5 ± 17.4 | 3.660 | 223 | *** | 57.6 ± 19.3 | 52.0 ± 19.5 | 2.311 | 258 | * | 46.8 ± 15.2 | 46.1 ± 16.0 | 0.393 | 257 | |
| PtFH | 7.4 ± 5.6 | 8.3 ± 6.2 | 1.238 | 223 | | 10.3 ± 5.3 | 11 ± 6.3 | 0.902 | 250 | | 13.7 ± 6.3 | 14.1 ± 6.2 | 0.534 | 257 | |
| AoPtFH | 42.5 ± 21.4 | 33.8 ± 16.6 | 3.115 | 177 | ** | 37.6 ± 15.8 | 32.5 ± 15.7 | 2.529 | 242 | * | 32.3 ± 13.8 | 33.8 ± 14.5 | 0.842 | 249 | |
| FD | 0.1 ± 0.3 | 0.1 ± 0.3 | 0.650 | 223 | | 0.1 ± 0.3 | 0.2 ± 0.4 | 0.992 | 239 | | 0.1 ± 0.3 | 0.1 ± 0.4 | 0.378 | 257 | |
| Interceptions | 0.0 ± 0.1 | 0.0 ± 0.2 | 1.160 | 188 | | 0.0 ± 0,2 | 0.1 ± 0.3 | 1.651 | 174 | | 0.1 ± 0.3 | 0.1 ± 0.3 | 0.182 | 257 | |
| Clearances | 0.9 ± 1.0 | 1.0 ± 1.0 | 0.338 | 223 | | 1.1 ± 1.1 | 1.7 ± 1.4 | 3.891 | 245 | *** | 1.4 ± 1.4 | 1.9 ± 1.6 | 2.882 | 257 | ** |
| FC | 0.0 ± 0.2 | 0.0 ± 0.3 | 0.254 | 223 | | 0.0 ± 0.1 | 0.0 ± 0.2 | 0.843 | 258 | | 0.0 ± 0.1 | 0.0 ± 0.2 | 0.459 | 257 | |
| YC | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.705 | 223 | | 0.0 ± 0.2 | 0.2 ± 0.4 | 3.421 | 258 | *** | 0.1 ± 0.2 | 0.1 ± 0.3 | 1.154 | 244 | |
| Tackles | 0.0 ± 0.2 | 0.0 ± 0.1 | 1.141 | 149 | | 0.0 ± 0.2 | 0.0 ± 0.2 | 0.738 | 258 | | 0.1 ± 0.2 | 0.0 ± 0.1 | 1.925 | 195 | |
| BR | 8.1 ± 3.1 | 8.7 ± 3.3 | 1.310 | 223 | | 10.4 ± 4.1 | 10.8 ± 3.9 | 0.812 | 258 | | 11.1 ± 3.4 | 10.9 ± 3.5 | 0.358 | 257 | |
| Saves | 2.7 ± 1.9 | 3.1 ± 1.7 | 1.527 | 207 | | 3.2 ± 1.6 | 4.1 ± 2.1 | 3.828 | 230 | *** | 3.1 ± 2.0 | 3.7 ± 2.2 | 2.160 | 245 | * |
| Catches | 1.0 ± 1.1 | 1.3 ± 1.5 | 1.572 | 205 | | 1.4 ± 1.4 | 1.7 ± 1.5 | 1.675 | 258 | | 1.2 ± 1.1 | 1.6 ± 1.3 | 2.688 | 244 | ** |
| LB | 9.4 ± 5.9 | 12.1 ± 6.4 | 3.282 | 223 | ** | 12.5 ± 5.9 | 14.9 ± 7.0 | 3.001 | 258 | ** | 15.8 ± 6.1 | 17.1 ± 6.3 | 1.637 | 257 | |

*Note 1: *p<0.05, **p<0.01, ***p<0.001*

*Note 2: Lower and upper quartiles were removed due to table size limitations*

*Note 3: BT = Ball Touches, PA = Pass Accuracy (%), PtFH = Passes to Forward Half, AoPtFH = Accuracy (%) of Passes to Forward Half, FD = Fouls Drawn, FC = Fouls Committed, YC = Yellow Cards, BR = Ball Recoveries, LB = Lost Balls.*

## DISCUSSION

The aim of the study was to examine the technical and tactical performance of goalkeepers of different team levels under different situational conditions (i.e., opposition, outcome and location) in the Spanish First Division Professional Football League.

Results showed that there were differences in most of the match performance indicators for goalkeepers. Goalkeepers of high level teams achieved less BT, Passes, PtFH, Interceptions, Clearances, YC, BR, Saves, Catches and LB, but higher PA and AoPtFH. This is possibly due to the fact that high level teams were subjected to less attacking play from the opponents, whereas the opposite happened to goalkeepers of low level teams. Similar findings were found by Szwarc et al. [28]. Meanwhile, Seaton and Campos [1] suggested that there were differences between goalkeepers from different levels in terms of ball distribution and success of performance indicators. First team goalkeepers showed better performance on successful rolled and thrown distributions, while the third team's goalkeeper was the most successful at kicked distributions.

When taking into account opponent quality, Saves were the only indicator that differed for goalkeepers of all three levels. Surprisingly, high level team goalkeepers made more saves when facing low level teams than when facing high and intermediate level teams. These results could be explained by the different strategies employed by teams. However, few studies have examined this fact [19, 29]. Lago [29] suggested that playing against strong opposition led to a loss of ball possession. Nevertheless, this conclusion cannot explain why high level team goalkeepers made more saves when facing low level teams than when facing high and intermediate level teams. Based on the findings in water polo [30] and handball [31], there is an indication that matches between unbalanced opponents (i.e., high vs. low) produce more open game contexts than those between balanced opponents (i.e., high vs. high) which lead to more shots for both sides. In short, when high-level teams play against low-level teams, they may choose more offensive game strategies which lead to their counterparts having more shots on counter attacks. On the other hand, when high-level teams play against high and intermediate level teams, they tend to adopt a more defensive game strategy, which leads to fewer shots for both sides.

Previous research showed that shots, shots on goal, passes, successful passes, crosses, crosses against, and ball possession were the variables that best differentiated winners, drawers and losers in the UEFA Champions League [22] and Spanish football league [32]. These results could explain the goalkeeper performance of intermediate level teams who showed variance in the indicators of PtFH, Catches, LB, FD and PA in matches of win, draw and loss outcome. High level team goalkeepers showed no differences in their performance indicators during matches won, drawn and lost. Saves were the only indicator which differed for goalkeepers of low level teams when ending with different match outcomes. These results could be explained by the findings of Shafizadeh et al. [33] who believed that successful teams displayed better performance consistency in all key indicators in comparison to their lower level opponents.

It has been reported that different qualities of teams experienced different home advantages which could be reflected by different variations of technical and tactical performance indicators in home and away matches [16, 19, 29]. These inferences are also demonstrated by results of the current study. PA, AoPtFH and LB were the variables that discriminated between the home and away goalkeeper performance.

## LIMITATION

A limitation of the current research is that although situational variables were taken account

into the analysis, their interactions were not fully considered, which should be further directions of this kind of research. Another drawback of this study is that the goalkeeper's physiological performance (i.e., distance covered, velocity, intensity) is not included which should be combined in future research.

## CONCLUSION

High level team goalkeepers performed better than those of intermediate and low level team. They achieved the highest PA and AoPtFH, while the opposite occurred with goalkeepers of low level teams. Additionally, goalkeepers experienced different challenges and showed differential performance under different situational conditions depending on team level. Saves was the sole indicator that differed for goalkeepers of all three team levels. Moreover, Saves was the only varied indicator for goalkeepers of intermediate and low level teams when facing different opponent levels. In addition, goalkeepers of high level teams showed no differences in performance indicators during matches won, drawn and lost. Saves were the only indicator differed for goalkeepers of low level team when ending with different match outcomes.

These results can be used by goalkeepers and their coaches to modify their training programs depending on game contexts of upcoming matches. For example, goalkeepers of high-level team should focus more training on counter attack defenses against low-level teams. Information provided by the current research can also enable a more thorough understanding of goalkeeper performance characters from different team levels, and therefore can be used for talent identification and player selection in the transfer market [34]. For instance, high-level teams should choose the goalkeeper with the ability of achieving high pass accuracy as their potential signing.

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