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Section III – Sports Training

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Analysis of the Individual Set-Pieces Influence on the Teams' Ranking in Rink Hockey

by
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The main objective of this research was to analyze the individual set-pieces influence on the final season ranking in rink hockey. For this purpose, 6,920 individual set-pieces from 1,680 matches corresponding to free direct hits (n = 4,332) and penalty shots (n = 2,588) were analyzed during seven consecutive seasons (2012-13 to 2018-19) in the First Spanish League (Ok Liga). The variables recorded were the following for each team: total points, free direct hits attempted, free direct hits scored, penalties attempted, penalties scored, total goals scored during the season, free direct hits received, goals received from free direct hits, penalties received, goals received from penalties and total goals received in the season. Results showed that 21.08% of the goals were scored by free direct hits and penalty shots (11.58% and 9.49%, respectively). Likewise, teams ranked in a better position achieved higher effectiveness in individual set-pieces and their goalkeepers were more effective in defending the free direct hits and penalties. Furthermore, results showed significant correlations between team season points and better performance in individual set-pieces variables. Therefore, the results of this study demonstrated the importance of systematic practice of free direct hits and penalty shots for teams' success in rink hockey. Additionally, it is suggested that teams possess special players to execute these particular elements of match play.

***Key words**: performance analysis, roller hockey, match variables, shots.*

Introduction

Rink-hockey, also known as roller hockey or hardball hockey, is a team sport that involves quick actions and precise movements according to the required physical, technical, and tactical game demands (Yagüe et al., 2013). Like in other sports, the increasing professionalization in recent years resulted in an increase of studies related to variables affecting game effectiveness. Performance analysis, defined as the analysis of behavior in competitive sports, appears to be widely accepted by coaches, sports scientists, and players as a relevant procedure to analyze and improve performance (Drust, 2010; Liu et al., 2016). Rink-hockey is no exception and like other team sports, it seems necessary to identify the relevant performance indicators for this sport discipline.

Rink-hockey is a very successful and popular team-sport in Spain. Its national team is the current European champion and it is also the most successful team with a total of 17 World Championships. However, scientific literature about performance analysis in this sport is scarce. Of the few studies published on match variables, the most considered is the "home advantage" (HA) effect (Arboix-Alió and Aguilera-Castells, 2019; Arboix-Alió et al., 2020; Gómez et al., 2011) showing an approximate value of 60%, similar to other team sports. Other studies have analyzed variables such as the fact of "scoring the first goal of the match" (Arboix-Alió and Aguilera-Castells, 2018), goalkeepers' performance (Sousa et al., 2020; Trabal et al., 2019a, 2020), the winning half-time effect or the context's influence in free direct hits (Trabal et al., 2020).

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Among the different rink hockey game variables which can influence the match result, individual set-pieces such as a penalty (PEN) or a free direct hit (FDH) are much related to scoring. Like in many team sports, goals are one of the most difficult and attractive aspects due to the permanent expectation they create, as a single goal can have a decisive impact on the match outcome (Casali et al., 2014). For this reason, set-pieces have become decisive for the match outcome in team sports. In futsal, it is reported that 27% of the total goals are achieved from total set-pieces actions (Sarmento et al., 2016). More specifically, in handball 10% of goals (Ferrarri et al., 2020; Panagiotiset al., 2020) are scored from penalty actions. Despite the lack of specific data in rink hockey, these two specific actions (FDH and PEN) have a non-negligible importance, and many times the match result can be decided by the effectiveness of these set-piece actions (Massari, 2017).

Additionally, this kind of action tends to happen in higher frequency since the 2009-10 season, when the Rink Hockey Committee implemented a new regulation (Rink Hockey Committee, 2009). These regulation changes, such as 45 s ball possession per attack, the backcourt violation and the temporary numerical inferiority when a player is sanctioned with a blue card, were significant modifications that aimed to achieve a more offensive style. Anyway, the most influential change probably was penalizing teams with a FDH when they accumulate 10 fouls.

Given the gap in scientific literature, further research is warranted to establish the relationship between individual set-pieces success and team performance. Furthermore, and to the authors' knowledge, such studies in rink hockey players do not exist to date. Therefore, the main objective of this study was to analyze the set-pieces (FDH and PEN) influence on the final ranking in the First Spanish Division (*Ok Liga*). Given the paucity of available data assessing the relationship between the set-pieces success and ranking team performance, it was hypothesized that teams with higher effectiveness in set-pieces would be associated with a better final ranking.

Methods

Participants

In total, 6,920 set-pieces actions (4,332 FDH and 2,588 PEN) from 1,680 rink hockey Spanish league (*OkLiga*) games corresponding to 7 seasons (2012/2013 to 2018/2019) were analyzed.

Design and Procedures

Data were collected by professional technicians of the league. To assess data reliability 100 individual set-pieces were selected and two different observations were performed to assess intra- and inter-rater reliability. The consensus surpassed 90% on all criteria and categories (intra-observer k = 0.992; inter-observer k = 0.984). In addition, generalizability analysis was carried out (Cronbach et al., 1972), using SAGT software, version 1.0 (Hernández-Mendo et al., 2016) (Table 1). Following suggestions from Blanco-Villaseñor et al. (2014), two measurements were made to assess: a) the results of generalizability (number of individual set-pieces that made up the sampling) and b) the observation instrument's validity; a) the generalizability coefficient (relative and absolute = 0.996) corresponding to the measurement plan [Categories] / [set-pieces] establishes that with the number of set-pieces analyzed, you obtain high reliability of generalization precision; b) regarding the measurement plan [set-pieces] / [Categories], the generalizability coefficient (relative and absolute = 0.000) guarantees, in the theoretical framework of the Theory of Generalizability, the validity of the observation instrument designed (Blanco-Villaseñor et al., 2014; Blanco-Villaseñor and Escolano-Pérez, 2017).

The recorded variables were the following for each team per each season: total points, FDH attempted, FDH scored, PEN attempted, PEN scored, total goals scored, FDH received, goals received from FDH, PEN received, goals received from PEN, total goals received. The team quality and total points variables were used as independent variables comparing the other six factors described previously. The team quality variable was derived from the final ranking in the competition. From this analysis, four groups of teams were obtained: 1) *Euroleague group*: the first four (1-4) teams classified to play the Euroleague competition; 2) *WS Euro Cup group*: from the fifth to the eighth (5-8) team classified for the WS Europe Cup competition; 3) *Permanency group*: from the ninth to the twelfth (9-12) team that achieved permanence, and 4) *Relegation group*: from the thirteenth to the sixteenth (13-16) team

which composed the group of teams which lost the category.

The individual set-pieces (FDH and PEN) sequences were downloaded from the platform of the Royal Spanish Skating Federation and viewed using Kinovea v. 0.8 (17) software. Excel 13 was used to generate the records. Finally, the data were processed using SPSS (Version 20 for Windows; SPSS Inc., Chicago, IL, USA) software.

Statistical analyses

The descriptive analysis included the calculations of mean and standard deviation. The distribution of data was assessed using the Shapiro-Wilk test, which identified a normal distribution of the data set. The one-way ANOVA with Bonferroni correction post-hoc tests were carried out to establish comparisons between the groups. Moreover, effect-sizes (ES) were calculated using the partial eta squared (ηp2), to show the magnitude of the effects, and their interpretation was based on the following criteria: 0.01 ≤ small, 0.06 ≤ medium, 0.14 ≤ large effect (Cohen, 1988).

The relationship between total points and the set-pieces variables (penalty attempts, penalties scored, free direct hit attempts, free direct hits scored, total goals scored) were analyzed using Pearson's correlations (r). Statistical significance was established at $p \leq 0.05$. Correlations' magnitudes were evaluated using Hopkins' scale and interpreted as follows: trivial (0.00–0.09), small (0.10–0.29), moderate (0.30–0.49), large (0.50–0.69), very large (0.70–0.89), nearly perfect (0.90–0.99), and perfect (1.00) (Hopkins et al., 2009).

Results

It was found that 21.08% of the goals in rink hockey were scored by individual set-pieces. Specifically, from FDH (11.58%) and PEN (9.49%).

The main effect was observed for the ranking team groups in the offensive set-pieces variables of FDH goals, FDH effectiveness (%), PEN goals, set-pieces goals and set-pieces effectiveness (%) ($F_{(3,108)} = 10.428$ $p = 0.000$, $\eta_P^2 = 0.225$; $F_{(3, 108)} = 4.505$ $p = 0.005$, $\eta_P^2 = 0.111$; $F_{(3, 108)} = 2.961$ $p = 0.035$, $\eta_P^2 = 0.076$; $F_{(3, 108)} = 9.974$ $p = 0.000$, $\eta_P^2 = 0.217$; $F_{(3, 108)} = 5.687$ $p = 0.001$, $\eta_P^2 = 0.136$, respectively).

Likewise, significant differences were found between team ranking groups in all defensive set-pieces variables ($F_{(3, 108)} = 3.529$ $p = 0.022$, $\eta_P^2 = 0.194$; $F_{(3, 108)} = 5.896$ $p = 0.002$, $\eta_P^2 = 0.287$; $F_{(3, 108)} = 3.294$ $p = 0.029$, $\eta_P^2 = 0.183$; $F_{(3, 108)} = 4.817$ $p = 0.005$, $\eta_P^2 = 0.247$; $F_{(3, 108)} = 5.653$ $p = 0.002$, $\eta_P^2 = 0.278$; $F_{(3, 108)} = 9.313$ $p = 0.000$, $\eta_P^2 = 0.388$; $F_{(3, 108)} = 2.779$ $p = 0.052$, $\eta_P^2 = 0.159$).

Table 2 shows the pairwise comparison between the ranking team groups and the set-pieces variables.

Table 3 shows the correlation matrix between the ranking team performance, expressed as total season points per team, and their offensive set-pieces variables. Significant correlations for FDH effectiveness, PEN goals and set-pieces effectiveness with moderate magnitude (r = 0.30 to 0.47; $p < 0.01$) and for FDH goals and set-pieces goals with large magnitude (r = 0.54 to 0.57; $p < 0.01$) were found. Conversely, no significant correlations were found either with the effectiveness of penalties or with the total goals percentage from set-pieces.

Table 4 shows the correlations between the ranking team performance with defensive set-pieces variables. Significant negative correlations with a moderate to large magnitude were found for all variables (r = - 0.33 to - 0.55; $p < 0.05$) except "goals received from FDH". Furthermore, a significant correlation was found between the team season points and the percentage of total goals received from set-pieces (r = 0.54; $p < 0.01$).

Discussion

The main purpose of this research was to analyze the individual set-pieces (FDH and PEN) influence on the teams' final ranking in rink hockey**.** The main findings were that teams classified in a better position achieved higher effectiveness in individual set-pieces and their goalkeepers were more effective in defending the FDH and PEN. Additionally, results showed significant correlations between team season points and better performance in many individual set-pieces variables.

The first finding of the present study indicates that in rink hockey, 21.08% of the goals are scored by FDH and PEN (11.58% and 9.49% respectively). These data reinforce the importance of these two specific actions in the final outcome. To the best of our knowledge, no previous rink hockey studies are available to compare, however, these findings are consistent with other team

sports where attacking set-pieces play an increasing role as a destabilizing factor in the offensive phase (Fernández-Hermógenes et al., 2017). In this vein, Ramos and Oliveira (2008) and Pérez and Fonseca (2015) reported that the number of goals scored in a soccer season from set-pieces accounts for between 31-37% of the total goals scored. Furthermore, Sarmento et al. (2016) reported that 27% of the total goals were achieved from set-pieces in futsal, highlighting the importance of these actions which represents 25.75% of the total shots (Leite, 2012). With regard to penalties, Ferrarri et al. (2020) and Panagiotiset al. (2020) reported values around 10% in handball, very close to those reported in the present study in rink hockey. The court dimensions, the number of players and the dynamics of the game of rink hockey and those both sports could explain the similar values.

Table 1

Results corresponding to the generalizability design [Categories] [Set-pieces].

	SC	*df*	Mean square	Random	Mixt	Corrected	%	Standard error
[set-pieces]	0.33	636	0.001	-0.005	-0.005	-0.005	0	0
[cat]	1014.638	26	39.025	0.061	0.061	0.061	30.645	0.016
[set-pieces][cat]	2284.621	16536	0.138	0.138	0.138	0.138	69.355	0.002

Table 2

Descriptive analysis of set-pieces goal actions according to team groups. The data are shown as mean ± SD.

		Euroleague group	WS Europe Cup group	Permanency group	Relegation group
OFFENSIVE SET-PIECES	FDH goals	14.68 ± 5.51	10.61 ± 3.91*	9.89 ± 3.37*	8.75 ± 3.81*
	FDH effectiveness (%)	32.37 ± 8.89	27.97 ± 7.34	27.19 ± 6.53	24.97 ± 8.01*
	PEN goals	10.79 ± 4.36	8.82 ± 3.75	8.86 ± 4.49	7.54 ± 3.83*
	PEN effectiveness (%)	41.67 ± 11.07	38.48 ± 8.07	41.55 ± 13.43	34.39 ± 11.95
	Set-pieces goals	25.46 ± 8.08	19.43 ± 5.39*	18.75 ± 5.94*	16.29 ± 6.38*
	Set-pieces effectiveness (%)	35.91 ± 7.86	32.31 ± 5.09	32.28 ± 6.53	28.54 ± 6.94*
	Goals percentage from set-pieces	20.39 ± 6.57	22.46 ± 9.49	24.82 ± 12.71	27.32 ± 19.93
DEFENSIVE SET-PIECES	Goals received from FDH	11.42 ± 3.77	11.83 ± 4.17	10.42 ± 4.05	15.25 ± 3.44 §
	Effectiveness FDH received (%)	22.27 ± 4.87	28.54 ± 8.36	28.14 ± 6.59	34.26 ± 7.63*
	Goals received from PEN	9.67 ± 2.49	10.25 ± 2.63	13.00 ± 5.64	13.58 ± 3.26*
	Effectiveness PEN received (%)	36.04 ± 7.69	32.37 ± 5.84	41.25 ± 11.13 †	43.64 ± 6.34 †
	Goals received from set-pieces	21.08 ± 4.79	22.08 ± 4.85	23.42 ± 6.15	28.83 ± 5.73 *†§
	Effectiveness set-pieces received (%)	27.19 ± 4.33	30.33 ± 4.15	34.78 ± 6.69*	38.23 ± 6.41*†
	Received goals percentage from set-pieces	25.64 ± 7.82	21.25 ± 3.59	19.87 ± 3.93*	21.57 ± 4.14

**_Statistically different than the Euroleague group; †_Statistically different than the WS Europe Cup group; §_Statistically different than the Permanency group*

Table 3

Pearson's correlation between team season points and offensive set-pieces variables.

	FDH goals	FDH effectiveness	PEN goals	PEN effectiveness	Set-pieces goals	Set-pieces effectiveness	Goals percentage from set-pieces
Team season points	0.566**	0.442**	0.302**	0.250	0.544**	0.467**	-0.175

** ($p < 0.05$); ** ($p < 0.01$).*

Table 4

Pearson's correlation between team season points and defensive set-pieces variables.

	Goals received from FDH	Effectiveness FDH received (%)	Goals received from PEN	Effectiveness PEN received (%)	Set-pieces goals received	Effectiveness set-pieces received (%)	Goals percentage received from set-pieces
Team season points	-0.215	-0.450**	-0.396**	-0.330*	-0.432**	-0.550**	0.543**

* ($p < 0.05$); ** ($p < 0.01$).

One of the main findings of this study was that when comparing set-pieces effectiveness according to the final teams' success (end-season ranking), the best teams achieved higher effectiveness in both total set-pieces goals and effectiveness. Teams classified in the *Euroleague* group achieved a higher significant average of goals from FDH than the other teams. Additionally, this effectiveness was higher indicating better performance in this kind of actions. This fact could be explained by two reasons. The first one is that best teams tend to have more ball possession and generate more goal opportunities forcing their opponents to longer defence phases and to produce fouls in order to avoid goal chances. This increase in the number of fouls when a team is losing, occurs in other team sports such as waterpolo (Lupo et al., 2014; Mirvić et al., 2011) and handball (Ćeleš et al., 2014). Furthermore, considering the new rink hockey regulation which penalizes teams with a FDH when accumulating 10 fouls or when one player is sanctioned with a blue card, the differences in the number of total FDH attempts during a season have risen between better and worse classified teams. Regarding the differences in FDH goal effectiveness, it could be explained by the higher technical quality of players in their squads. Thus, considering that FDH is probably the most technical action in this sport (Trabal et al., 2019a, 2020), having specialist shooters can be determinant. However, this difference in performance between ranking-teams was non-significant for PEN shots. This could be explained because the PEN is a less technical and direct shot, while in FDH the player can progress towards the goal enabling higher variability of options.

Concerning the percentage of total goals

from set-pieces actions, although there are no significant differences according to the team rank, the worst classified teams obtain a higher percentage of total goals from individual set-pieces actions. According to other team sports, worst classified teams produce less goal opportunities than their counterparts during the game (Campos et al., 2015; Gómez et al., 2014; Lago-Peñas et al., 2010, 2011). This could explain the relationship between the low final goal percentage from set-pieces and the low team ranking.

With regard to the set-pieces actions received, there were also significant differences in goalkeeper performance between teams according to their final ranking. Results showed that goalkeepers from the *Euroleague* group teams had a significantly higher percentage of goals from set-pieces (27.19%) than *Permanency* or *Relegation* group teams (34.78% and 38.23%, respectively). This was observed by Trabal et al. (2019b) in the *OkLiga*, showing that the best teams had the best goalkeepers in set-pieces actions.

Regarding the correlation between team season points and offensive set-pieces variables, significant correlations for FDH effectiveness, PEN goals and set-pieces effectiveness with moderate magnitude ($r = 0.30$ to 0.47; $p < 0.01$) and for FDH goals and set-pieces goals with large magnitude ($r = 0.54$ to 0.57; $p < 0.01$) were found. Conversely, no significant correlations were observed either with PEN effectiveness or with the goals percentage from set-pieces. Analyzing the defensive actions, negative significant correlations were found for all variables ($r = -0.33$ to -0.55; $p < 0.05$) except "goals received from FDH", reinforcing that goalkeepers from best teams reached higher performance. Furthermore, a significant correlation was found between the team season points and the percentage of total goals received from set-pieces ($r = 0.54$; $p < 0.01$).

Despite the usefulness of these findings, the present study has some limitations which must be acknowledged. Firstly, the lack of studies about rink hockey to establish comparisons reduces the possibility to identify some tendencies between findings. In addition, the technical actions of players have not been analyzed. The strength of our study lies in the number of set-pieces actions analyzed during a seven-year period from one of the most prestigious rink hockey leagues, which is a comprehensive study on a minority sport over time. Future research should also consider the contextual variables' influence on set-pieces actions success. The study of other rink hockey competitive contexts like the female hockey league, other championships (i.e., Italian league, Portuguese league, international championships) or lower levels of competition (grassroots sport or minor leagues) would be interesting.

Conclusions and Practical implications

In conclusion, the current study indicates that effectiveness in set-pieces actions, especially FDH is related to better team performance. Moreover, the goalkeepers from high-ranked teams achieved higher success in defending set-pieces.

In light of these results, rink hockey coaches should be encouraged to include the systematic practice of FDH and PEN shots in their training programs. Designing the individual set-pieces actions practice needs to be innovative in order to recreate the levels of anxiety, distraction and perceptions of control raised by such high-pressure situations (Jordet et al., 2007; Wood et al., 2015). Additionally, these findings suggest the necessity for teams to have specialist players in this kind of action. Considering the rink hockey regulation which allows the substitution of players with no limits during the game, it could be decisive for a team to have a specialist goalkeeper for FDH or a PEN shooter that participates only in this specific match moments.

References

Arboix-Alió J, Aguilera-Castells J. The influence of scoring first in roller hockey. *Cuad Psico Deporte*, 2018; 18(3): 220–231

Arboix-Alió J, Aguilera-Castells J. Analysis of the home advantage in roller hockey. *J Sport Health R*, 2019; 3(11): 263–272

Arboix-Alió J, Buscà B, Trabal G, Aguilera-Castells J, Sánchez-López MJ. Comparison of home advantage in men's and women's Portuguese roller hockey league. *Cuad Psico Deporte*, 2020; 20(1): 181–189

Blanco-Villaseñor A, Castellano J, Hernández-Mendo A, Sánchez-López CR, Usabiaga O. Application of the generalizability theory in sport to study the validity, reliability and estimation of samples. *Rev Psicol Deporte*, 2014; 23(1): 131–13

Blanco-Villaseñor A, Escolano-Pérez E. Observational data analysis using generalizability theory and general and mixed linear models: an empirical study of infant learning and development. *An Psicol*, 2017; 33(3): 450–460

Campos FAD, Pellegrinotti ÍL, Pasquarelli NB, Rabelo NF, Santa Cruz RAR, Gómez MÁ. Effects of game-location and quality of opposition in futsal league. *Int J Perf Anal Sport*, 2015; 15(2): 598–607

Casali CA, Maneiro R, Ardá T, Losada JL, Rial A. Effectiveness of indirect free kicks in elite soccer. *Int J Perf Anal Sport*, 2014; 14(3): 744–760

Ćeleš N, Vojvodić M, Skender N. A Comparative Analysis of Shooting Efficiency in Handball at Euro 2012. *Sport Sci Health,* 2014; 8(2): 131–137

Cohen J. *Statistical power analysis for behavioural science*. NJ: Lawrence Erlbaum; 1988

Cronbach LJ, Gleser GC, Nanda H, Rajaratnam N. *The dependability of behavioral measurements: theory of generalizability for scores and profiles*. New York: Wiley, Ed.; 1972

Drust B. Performance analysis research: Meeting the challenge. *J Sport Sci*, 2010; 28(9), 921–922

Fernández-Hermógenes D, Camerino O, García de Alcaraz A. Set-piece Offensive Plays in Soccer. *Apunt Educ Fis y Deportes,*, 2017; 129: 78–94

Ferrari W, Dias G, Sousa T, Sarmento H, Vaz V. Comparative Analysis of the Offensive Effectiveness in Winner and Losing Handball Teams. *Frontiers in Psychology*, 2020; *11*: 1-7

Gómez MA, Lago-Peñas C, Viaño J, González-Garcia I. Effects of game location, team quality and final outcome on game-related statistics in professional handball close games. *Kinesiology*, 2014; 46(2): 249–257

Gómez MA, Pollard R, Luis-Pascual JC. Comparison of the home advantage in nine different professional team sports in Spain. *Percep Motor Skills*, 2011; 113(1): 150–156

Hernández-Mendo A, Blanco-Villaseñor A, Pastrana JL, Morales-Sánchez V, Ramos-Pérez FJ. SAGT: New software for generalizability analysis. *Rev Iberoam Psicol del Ejerc y el Deport*, 2016; 11(1): 77–89

Hopkins WG, Marshall SW, Batterham AM, Hanin J. Progressive Statistics for Studies in Sports Medicine and Exercise Science. *Med Sci Sport Exer*, 2009; 41(1): 3–13

Jordet G, Hartman E, Visscher C, Lemmink KAPM. Kicks from the penalty mark in soccer: The roles of stress, skill, and fatigue for kick outcomes. *J Sport Sci*, 2007; 25(2): 121–129

Lago-Peñas C, Lago-Ballesteros J, Dellal A, Gómez M. Game-related statistics that discriminated winning, drawing and losing teams from the Spanish soccer league. *J Sport Sci Med*, 2010; 9(2): 288–293

Lago-Peñas C, Lago-Ballesteros J, Rey E. Differences in performance indicators between winning and losing teams in the UEFA Champions League. *J Hum Kinet*, 2011; 27(1): 135–146

Leite WS. Analysis of the offensive process of the Portuguese futsal team: A comparison between the actions of finalization. *Pamukkal***e** *spor bilim. derg*, 2012; 3(3): 78–89.

Liu H, Hopkins WG, Gómez MA. Modelling relationships between match events and match outcome in elite football. *Eur J Sport Sci*, 2016; 16(5): 516–525

Lupo C, Condello G, Capranica L, Tessitore A. Women's Water Polo World Championships. *J Strength Cond Res*, 2014; 28(1): 210–222

Massari G. *L'hockey su pista. Dalle individualità al gioco di squadra tra abilità e ultrabailità*. Roma: CONI Servizi; 2017

Mirvić E, Kazazović B, Aleksandrović M. Differences between winning and losing teams from World water polo championship for women. *Homo Sport*, 2011; 13(2): 41–43

Panagiotis MG, Konstantinos NS, Ioannis BA. Stable and changing characteristics of high-level handball as evidenced from World Men's Championships. *J Phys Educ Sport*, 2020; *20*(3): 1354-1361.

Pérez S, Fonseca D. Influence of set pieces in national and international elite football: Analysis of competition factors and playing at home or away. *Rev Digit Educ física, 2015; 32*(32): 41–52

Ramos LA, Oliveira MH. Soccer: classification and analysis of the goals of EuroCopa 2004. *Rev Bras Futeb*, 2008; 01(1): 42–48

Sarmento H, Bradley P, Anguera MT, Polido T, Resende R, Campaniço J. Quantifying the offensive sequences that result in goals in elite futsal matches. *J Sport Sci*, 2016; 34(7): 621–629

Sousa T, Sarmento H, Marques A, Field A, Vaz V. The influence of opponents' offensive play on the performance of professional rink hockey goalkeepers. *Int J Per Anal Spor*, 2020; 20(1): 1-11

Trabal G, Daza G, Arboix-Alió J. Influence of contextual variables in the intervention of the rink hockey goalkeeper in the free direct hit. *Cuad Psico Deporte*, 2020; *20*(2): 139–151

Trabal G, Daza G, Riera J. The Technical Skills of Rink Hockey Goalkeeper in Direct Free Hit. *Retos*, 2019a; 36: 69–73

Trabal G, Daza G, Riera J. Influence of Direct Free Hits on the OK Liga Ranking of Rink Hockey. *Kronos*, 2019b; 18(1): 1–9

Trabal G, Daza G, Riera J. Goalkeeper Effectiveness in the Direct Free Hit of Rink Hockey. *Apunt Educ Fis y Deportes*, 2020; 139: 56–64

Wood G, Jordet G, Wilson MR. On winning the "lottery": psychological preparation for football penalty shoot-outs. *J Sport Sci*, 2015; 33(17): 1758–1765

Yagüe P, Del Valle M, Egocheaga J, Linnamo V, Fernández A. The competitive demands of elite male rink hockey. *Biol Sport*, 2013; 30(3): 195–199

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