

## ORIGINAL STUDIES

# Influence of the observation method as a selection procedure in the performance of Algerian goalkeepers

*Influența metodei observației ca procedură de selecție în performanța portarilor algerieni*

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### Abstract

*Background.* Many East European countries have revealed the weaknesses of the traditional method and have attempted to develop identification methods underpinned by scientific theory and evidence.

*Aims.* The present study was intended to determine the strengths and weaknesses of naked-eye appreciation practice by our coaches as a method for the selection of potential goalkeepers.

*Methods.* To achieve this objective, this comparative study tested 28 goalkeepers at the end of the first half of the season by the Penalty Kick Test, ‘T’ Drill Test, Ruler Drop Test (TR) and anthropometric parameters (BH, BMI, WC, and BW). The subjects were distributed into three groups depending on their success in the penalty test (PK%: GP1≈50% - GP2≈60% -GP3≈70% success).

*Results.* Based on the applied statistical methods and success in the penalty kick test, our results confirm the weakness of traditional methods recognized by scientists through their subjectivity in assessing the amount of body fat and its effect on physical performance. The disadvantages and the subjectivity of the observation method used to detect the errors of the GK body shape and their correction by training was concluded in the present study.

*Conclusions.* To forecast the success of talented goalkeepers in adult elite competition, anthropometric and physical characteristics are actually crucial to discriminate talented from non-talented soccer players. For this purpose, we recommend our coaches to support their observations. Setting up predisposing tests is required to enhance the credibility and objectivity of decisions in selecting/detecting or evaluating the progress of players in the long term or in the short term.

**Keywords:** observation method, selection, performance of Algerian goalkeepers.

### Rezumat

*Premize.* Numeroase țări est-europene au evidențiat slăbiciunile metodei tradiționale și au încercat să elaboreze metode de identificare susținute de teorii și dovezi științifice.

*Obiective.* Scopul acestui studiu a fost determinarea punctelor forte și slabe ale practicii de apreciere cu ochiul liber de către antrenorii noștri ca metodă de selecție a potențialilor portari.

*Metode.* Pentru realizarea acestui obiectiv, acest studiu comparativ testează 28 de portari la sfârșitul primei jumătăți a sezonului, pe baza testului loviturilor de penalty, testului T de agilitate, testului timpului de reacție (TR) și a parametrilor antropometrici (H, IMC, CT și G). Subiecții au fost distribuiți în trei grupe în funcție de succesul la testul loviturilor de penalty (PK%: GP1≈50% - GP2≈60% -GP3≈70%).

*Rezultate.* Pe baza metodelor statistice aplicate și a succesului la testul loviturilor de penalty, rezultatele noastre confirmă slăbiciunile metodelor tradiționale recunoscute de cercetători prin subiectivitatea aprecierii cantității de grăsime corporală și a efectului acesteia asupra performanței fizice. Acest studiu concluzionează cu privire la dezavantajele și subiectivitatea metodei observației utilizate pentru detectarea erorilor de morfologie a portarilor și la corecția acestora prin antrenament.

*Concluzii.* Pentru predicția succesului portarilor la nivel competițional de elită la categoria adulți, caracteristicile antropometrice și fizice sunt de importanță crucială pentru a diferenția între jucătorii de fotbal talentați și cei netalentați. În acest scop, recomandăm antrenorilor noștri să-și susțină observațiile. Este necesară utilizarea unor teste de predispoziție pentru creșterea credibilității și obiectivității deciziilor în selecția/depistarea sau evaluarea progresului jucătorilor pe termen lung sau scurt.

**Cuvinte cheie:** metoda observației, selecție, performanța portarilor algerieni.

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## Introduction

The process of player selection and team formation in multi-player sports is a complicated multi-criteria problem. As confirmed by scientists, our national football team never reached its cruising speed as long as the traditional method was used as a selection means in Algerian football. Zerf et al. (2016a) criticized the identification of overweight by the naked eye. According to FIFA, top overweight goalkeepers (Cantor & Konin, 2006) are asked to work harder (Kindall & Winkin, 2000) due to their extra pounds. Similar studies regarding the impact of anthropometric parameters on physical performance, as well as the limitations of traditional methods putting our coaches at risk for injuries in selecting their goalkeepers have been conducted (Zerf, 2016). Studies in various Eastern European countries have reported the weakness of the traditional method, which must be supported by scientific theories of evidence, as its observations are based on the naked eye of coaches (Wolstencroft, 2002; Zerf et al., 2016b). Papaioannou & Hackfort (2014) evidenced the multitude of problems that occur when coaches base their decisions on this method to differentiate talents from non-talents.

In general, the selection of soccer players and the formation of a team are based on judgments formulated by coaches relying on the best available information (Tavana et al., 2013), which is also the case of our national football team (Zerf et al., 2016c). Ziv & Lidor (2011) recommend that coaches should adopt a judicious approach when selecting their test protocols and devices for the assessment of the physiological attributes of goalkeepers.

## Hypothesis

The present study aimed to examine the strengths and weaknesses of the observation method, which is the most used in selecting potential goalkeepers. A qualitative and quantitative analysis based on football demands was performed, supported by a literature review. While quantitative values give the general trend, qualitative values suggest specific training for positions, which are shown in similar studies to be guidelines in establishing an individualized training and evaluation program in the players' career plan. The application of a scientific method to confirm the coaches' observations is currently supported. Setting up predisposing tests is required to enhance the credibility and objectivity of decisions in selecting/detecting or evaluating the progress of players in the long term or in the short term.

## Material and methods

### *Research protocol*

Based on suggestions that football coaches working with GKs need to know, professional adult GKs usually have a body mass under 5% (kg/m<sup>2</sup>) over the ideal weight related to height, more body fat requiring different physical and physiological training aspects (Sporis et al., 2009). In order to achieve this objective, our protocol was based on the study of relations between the selected players' performance in penalty stops vs others variables, which allowed us to distribute the sample into three groups depending on their success in the penalty test (PK%: GP1≈50% - GP2≈60% -GP3≈70% of success).

### *a) Period and place of the research*

All goalkeepers who participated in the present study were aged under 17 years, with the best ranking in the Oran Football League for 2015-2016.

### *b) Subjects and groups*

Homogeneity and normality were calculated based on age, training, and skills in the penalty kick test, the time of reaction (Ruler Drop Test) and Agility T-test, and anthropometric parameters (BH, BW, BMI, WC) at the end of the first half of the season used in the current study.

### *c) Tests applied*

- *Anthropometry, body composition, and body fat percent*

The body height (BH-cm) and body mass (BW-kg) of each player were measured, and the body mass index (BMI) (kg/m<sup>2</sup>) was calculated, as well as the body fat percentage based on waist circumference, which was highly correlated with the amount of intra-abdominal or visceral fat. To evaluate the results, we referred to the normative data of BMI by the World Health Organization according to Brown et al. (2006). For waistlines WC (cm), we agreed with the normative data provided by Medical Science (Zerf et al., 2016a).

### *- Ruler Drop Test (TR)*

The objective of this test is to monitor the athlete's reaction time. To undertake this test, a meter ruler and an assistant are required:

The assistant holds the ruler between the outstretched index finger and thumb of the athlete's dominant hand so that the top of the athlete's thumb is level with the zero centimeter line on the ruler.

The assistant releases the ruler and the athlete catches the ruler between their index finger and thumb as quickly as possible.

The assistant records the distance between the bottom of the ruler and the top of the athlete's thumb, where the ruler has been caught.

The test is repeated 2 more times and the average value is used for the assessment.

To evaluate the results, we referred to normative data adapted by Davis (2000) for 16 to 19 years of age.

### *- 'T' Drill Test (TD)*

Subjects start from the standing point at cone A, and they are asked to run in a straight line to go to B. Then, they move to cone C, which is on the left side. After touching cone C, they move to the right and touch cone D. Finally, they run again to the left, touch cone B, and run back to the starting position. Every subject performed three trials with the best score recorded for analysis.

### *- Test penalty kick skills (PK%)*

In the penalty kick scenario, the goalkeeper is the primary threatening source in the environment. In this study, we recruited 5 senior players who framed their shots well. Each goalkeeper had to stop the 5 shots. All penalties went by turns. Non-framed penalties were not counted (Hoffman, 2006). Based on results, we calculated the penalty stops % as a protocol tested in the present study.

### *d) Statistical processing*

The results were analyzed using SPSS software (version 20.0; SPSS, Inc., Chicago, IL). To assess the differences between the selected players, ANOVA followed by LSD was

**Table I**  
Descriptive statistics

Variables	Penalty stops	EN	Mean	SD	Shapiro-Wilk	p≤0.05	Levene's	p≤0.05	F	p≤0.05
BW	50%	14	68.3	5.70	0.97	0.59	0.28	0.76	0.07	0.94
	60%	6	67.35	5.25						
	70%	8	67.21	6.71						
	Total	28	67.65	5.70						
BH	50%	14	176.85	7.39	0.96	0.32	2.17	0.14	26.67	0.53
	60%	6	173.50	3.39						
	70%	8	176.87	6.01						
	Total	28	176.14	6.311						
BMI	50%	14	28.28	0.632	0.98	0.89	0.59	0.56	17.67	0.00
	60%	6	27.51	0.43						
	70%	8	26.66	0.69						
	Total	28	27.65	0.92						
WC	50%	14	91.35	3.56	0.97	0.77	1.38	0.27	24.12	0.00
	60%	6	87.41	1.51						
	70%	8	81.72	3.12						
	Total	28	87.75	5.160						
TR	50%	14	15.07	1.47	0.95	0.33	1.563	0.79	13.19	0.00
	60%	6	13.54	1.12						
	70%	8	12.31	0.72						
	Total	28	13.95	1.70						
TD	50%	14	15.13	1.78	0.53	0.32	0.23	0.77	24.27	0.00
	60%	6	12.25	0.50						
	70%	8	11.26	0.49						
	Total	28	13.41	2.19						

**Legend**

Waist circumference: ‡ 32.3 to 40.2(in)\* 61.8 to 68.0(cm) via Sportsmen, more suggestive of high abdominal/central obesity - body mass index (BMI) overweight≥25 - Ruler Drop Test Average 15.9 - 20.4 cm, 'T' Drill Test Average 10.13 - 10.37 sec, penalty kick skills - fewer goals.

performed using each variable. The results are described as mean and SD. The level of significance was established at p<0.05. Shapiro-Wilk and Levene's tests were conducted to calculate normality and homogeneity. The correlation was calculated individually (Tables I and II).

**Results**

The present study was designed to examine the strengths and weaknesses of processes practised by Algerian coaches in selecting potential goalkeepers, based on the penalty test, as a protocol to predict the weaknesses of our selected goalkeepers.

Through Table I based on applied statistics, our results indicate that our total sample is classified as overweight, given the BMI, with a WC over 80 cm as a health risk affecting the physical body shape and size (Edwards & Fernández, 2017). The ANOVA and LSD tests were significant via all comparisons, unlike for body weight (BW) and body height (WH). However, all comparisons by LSD were in favor of groups with more success in the penalty test, see Table II. All Pearson correlations between the penalty stops % success and other studied variables were strongly negative, as shown in Table III. Evoked by researchers in weight-for-height relationships, BMI index as well as BMI for WC as indicators of body weight confirm in the present study the need for a desirable normal body weight (Mahan et al., 2012) in our sample. Inappropriate body weight, body mass index (BMI) related waist sizes and body shape are reported to be factors suggestive of excess weight (Zerf, 2017), while its measurement is limited when using the naked eye as an approach for identifying potential goalkeepers. According to (Howley & Thompson, 2017), the negative influence of body fatness is correlated both mechanically and metabolically in most physical tasks that require translocation of body weight (Garrett & Kirkendall, 2000), which is illustrated

by (Boron & Boulpaep, 2012) in excess body fat affecting movements from becoming fluid and more energetic. Body fat measurement is currently supported (Zerf et al., 2017a), relative to defects of the observation method, which bases its judgments on the naked eye to estimate anthropometric parameters (Zerf, 2016 a). Zerf (2016b) shows their effect on the training process in the long term (Gusic et al., 2017). In this study, the weight-for-height relationship is estimated to help control body fat loss, which should allow coaches to understand the post-game demand (Zerf et al., 2016b).

**Table II**  
Differences based on the penalty stops percentage as a protocol in the present study.

Dependent variable	(I) KP	(J) KP	Mean difference (I-J)	Std. error	Sig.
BMI	50%	60%	.76381*	.30064	.018
		70%	1.61464*	.27307	.000
	60%	50%	-.76381*	.30064	.018
		70%	.85083*	.33274	.017
	70%	50%	-1.61464**	.27307	.000
		60%	-.85083*	.33274	.017
WC	50%	60%	3.94143*	1.52886	.016
		70%	9.63643*	1.38865	.000
	60%	50%	-3.94143*	1.52886	.016
		70%	5.69500*	1.69213	.002
	70%	50%	-9.63643*	1.38865	.000
		60%	-5.69500*	1.69213	.002
TR	50%	60%	1.52762*	.60251	.018
		70%	2.76554*	.54726	.000
	60%	50%	-1.52762*	.60251	.018
		70%	1.23792	.66686	.075
	70%	50%	-2.76554*	.54726	.000
		60%	-1.23792	.66686	.075
TD	50%	60%	2.87857*	.65042	.000
		70%	3.86357*	.59078	.000
	60%	50%	-2.87857*	.65042	.000
		70%	.98500	.71989	.183
	70%	50%	-3.86357*	.59078	.000
		60%	-.98500	.71989	.183

**Legend**

\*. The mean difference is significant at the 0.05 level.

**Table III**

The correlation between the penalty test and other studied variables.

Variable	BMI	WC	TR	AT	KP
Penalty test	-0.765**	-0.809**	-0.716**	-0.793**	1

**Legend**

\*\*. The correlation is significant at the 0.01 level (2-tailed).

**Discussions**

According to the data collected, in comparison with the normative data used in the present study, ANOVA and LSD tests are significant for all comparisons in favor of GKs with more success in the penalty test, confirmed by Pearson correlation negatively correlated with other studied variables. Our results confirm the deficiencies of the observation method based on the coach's naked eye. Anthropometric studies show that certain physical factors, including body fat, body mass, muscle mass and physique, significantly influence athletic performance (Moncef et al., 2012). This is documented in the case of this study by the weight for height and BMI for WC relationships as superior anthropometric parameters, which are indicators for the adjustment of body weight as a factor that influences performance, according to (Zerf et al., 2017b). The stability of body weight gain relative to the adjustment of body weight in correlation with GK performance is supported by the research team. In our opinion, an accurate assessment of body weight loss related to loads incorporated into the GK training program is required. Previous research has acknowledged immoderate body fat as a high-risk factor, injury being related to the increase of body mass index (BMI), leading to the exposure of athletes to a multitude of other risk factors, which requires an examination of the association between overweight and sports injury (Ezzat et al., 2014; Chaalali et al., 2016). Kraemer et al. (2012), as well as (Zerf, 2016a) evidence their consequences on physical performance and the relation between body composition and athletic performance; a high level of fitness correlated with an optimal athletic body composition should be maintained (Maćzka et al., 2017). Body composition analysis is part of physical fitness assessment to estimate the gain of fat correlated with lean muscle levels (Halfmann, 2012) as expected by the global target weight loss program, including the reduction of body fat (Griffin, 2015) to achieve the desired body composition. Our recommendations are directed to our fitness coaches and especially to goalkeeper coaches:

To control and record changes in body fat levels, appreciated by the influence of exercise training on physiological and performance changes related to weight loss as an assessment program (Kraemer et al., 2012).

To seek desirable physical characteristics associated with anthropometric parameters (Robertson et al., 2015).

To integrate our goalkeepers in all training sessions (Hadjar et al., 2016), including constant exercise (Di Iorio & Ferretti, 2004) to maintain or to improve physical fitness (Hoeger & Hoeger, 2015) as well as basic skills.

To use the scientific method (programming or evaluating) as a fundamental and significant practice to achieve Olympic level performance in any sports discipline (Prajapat, 2015).

**Conclusions**

1. Because of the differences obtained by the research team, it can be concluded that the method of observation is a more subjective method for the selection of Algerian GKs. For this reason, we recommend to our Algerian coaches to establish their judgement on predisposing tests to enhance the credibility and objectivity of their decisions in selecting/detecting or evaluating the progress of their players in the long term or in the short term.

2. This study shows the limitations of traditional methods for selecting potential goalkeepers. Anthropometric characteristics interrelated with physiological demand assessment associated with body composition changes (body fat, bone and muscle) require a scientific basis to quantify the load of training programs, allowing to improve physical performance in accordance with anthropometric levels.

**Conflicts of interests**

None.

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