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MORPHOLOGICAL PROFILE AND PHYSICAL CAPACITIES OF MALIAN GOALKEEPERS UNDER 23

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ABSTRACT

The relationship between morphology and specific abilities related to soccer goalkeepers is rarely analyzed, despite the few studies developed in this field Therefore, the aim of this study is to determine the morphological profile of malian goalkepers U23 in soccer. It is known that team sports such as soccer are very complex due to the anthropometric, physiological, psychological, perceptual and technical parameters involved, in addition to the requirements related to the knowledge of the game in order to develop any game strategy. As such, it is apparent that any initiative to identify the morphotypology of soccer goalkepers is now important.

This study concerns football goalkeepers from Mali U 23. The experimental population is composed of football goalkeepers whose age varies between 20 and 22 years.

According to F.I.F.A regulations, it corresponds to the category U23. We used anthropometry method for measuring the various morphological parameters (lengths, diameters, circumferences and skin folds) ; physical tests and statistical calculations. To assess the level of these U23 goalkeepers, it is necessary for us to determine the morphological characteristics through easily usable parameters and to identify the morphotypology of our elite.

Keywords: Goalkeepers, Malian, morphology, physical capacities

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INTRODUCTION

Currently, sport is a crossroads of major continental and even global confrontations, a set of physical activities based on effort and training practiced according to specific rules for the purpose of competition. Football has evolved a lot in recent decades according to Bangsbo (1994), both in terms of performance parameters, as noted by Bangsböo, J. Et al, (2002), and team play according to Cazorla Et al, (1993).

The evolution of science, technology, facilities, media coverage, teaching methods, passions contribute a lot to the optimization of sports performance. To achieve the result the player must go through stages, at least ten years (pre-training, training, development and competition). If the current results in football have reached such a level of performance, it is thanks to the contribution of sports sciences, and among these sciences we can cite pedagogy, methodology, psychology and of course morphology.

The physical demands are due to the intense rhythm changes: lactic anaerobic (resistance), ability to repeat races: aerobic (endurance), physical resistance, motor coordination, flexibility and better relaxation for aerial duels. For this you need good endurance, good relaxation, flexibility, strength, speed and better coordination. We have seen in recent years the positive impact of aerial duels won on the outcome of matches, which requires an adequate morphology. It is true that height plays a very important role in football especially the position of goalkeeper, but we must however not forget to take into account the innate factors of certain goalkeepers. Despite this crucial importance that characterizes current football, the morphological factor remains undefined and poorly exploited until now, and this encourages us to define the morphological data of the different Malian goalkeepers. This data must be put to the benefit of the coaches for the choice of the best goalkeepers.

In addition to morphology, today's football has requirements to achieve performance; These are: the physical aspect, the technical-tactical and the psychological. In Mali, football is the king sport and coaches are always interested in general in physical work, technical-tactical, psychology, while each position has its morphological characteristics. It is in these characteristics that the player finds all his sensations to play better and perform better. So coaches must take this requirement into account, especially football goalkeepers. For this, the question asked is to know what is the morphological profile of Malian football goalkeepers Under 23 (U23). This study will focus

on the determination of the morphological profile and the physical abilities of Malian football goalkeepers U 23. The main objective of our study is the

Moreover, the interest of this study lies in its specificity and its originality, the multiple problems that goalkeepers encounter during their training, during matches and during their activity. Indeed, this is an area still unexplored at the level of Malian football. In order to determine the morpho-functional profile of Malian goalkeepers, we assigned ourselves the following tasks; anthropometric measurements of body segments, wingspan, weight gain, calculation of indices of physical development. A tall football goalkeeper naturally has bigger arms, bigger legs, a wider chest and shoulders. The size of the big, wider hand and the span of the carrying hand, depending on its role on the pitch. He is the only player authorized to play with the hand (pick up, take it, box, throw back) and all this in his penalty area. With a dimension of 2.44m in usable height and 7.32m in length, the goalkeeper's wingspan measurement is between 2.00m and 2.05m and with a usable height of at least 2.45m which is greater than or equal to the pole height. The morphological specialty of each position is directly linked to the role of the player on the field (Dufour Et al, 1987). Now the morphology of the football goalkeeper has changed. He is taller (around 1m90). Size and wingspan are key to performance.

Methodology :

This study concerns football goalkeepers from Mali U 23. The experimental population is composed of football goalkeepers whose age varies between 20 and 22 years. According to F.I.F.A regulations, it corresponds to the category of hopefuls or Olympic, commonly known as U 23. These goalkeepers are qualified as well-trained subjects. It is made up of 39 first and second division goalkeepers. We specify that our athletes are all adults, male and practicing high level football. This population is supposed to provide us with reliable and credible information on the so-called research "determination of the morphological profile and the physical capacities of Malian football goalkeepers".

This study was carried out in the annex of the March 26 stadium in Bamako and in the large basketball hall of the INJS (national institute for youth and sports), in commune 6 in the district of Yirimadjo, on the road RN6 linking the fourth Segou region. This study took place from January 7 to February 22,

2020, a cross-sectional study. We used the following methods: - anthropometry for measuring the various morphological parameters (lengths, diameters, circumferences and skin folds) according Lohman Et al. (1988);

- physical tests ;

- statistical calculations.

As materials, we used an anthropometric kit for the different measurements,

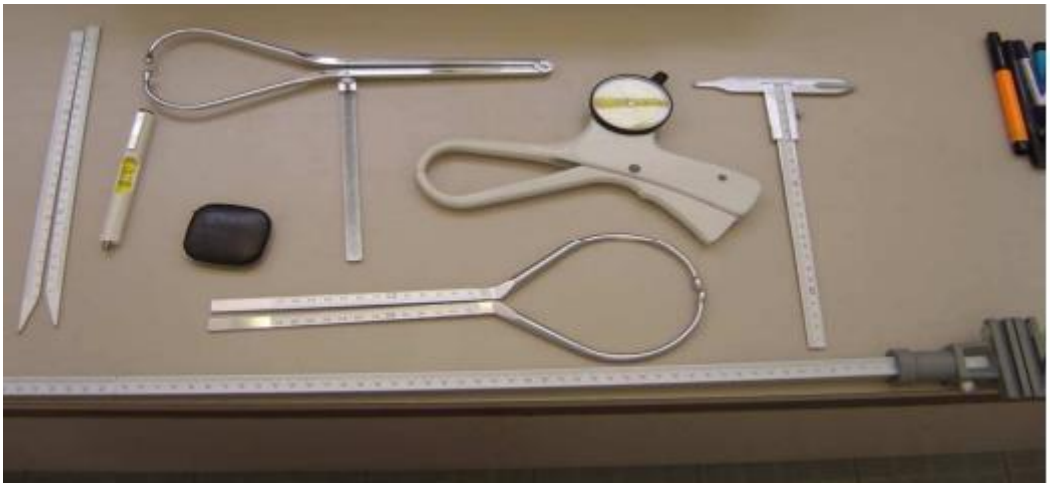

Figure 1 Anthropometric trousse G.P.M (Siber Hegner)

And for the weight we used a medical scale of the SECCA type. Physical tests include: endurance, starting speed, vertical jump (Sargeant test) The Vertical Jump can be transformed into a power expression by means of the following formula: Power = Body mass (kg) x (4.9 x heights reached (m))² or Power = (6.19 height reached) + (36) (Body weight -1822) according to "Harman et al"(1991) in CREPS Aquitaine-Evaluation.

Statistical calculation : For all the calculations of our research work, we used the following statistical descriptive calculation according to (Champely S, 2004).

Results :

Total parameters are represented by age, weight, height, wingspan, anthropometric points, body lengths and physical development indices. For the physical tests, we used the trigger, the power, the endurance (the number of stages, the distance traveled and the speed over 10 meters. We used the coefficient of variation (for a descriptive reading of the results and to compare the degree of variation from one sample to another. The CV% is a relative measure of the dispersion of data around the mean. According to Zatsiorsky

(1978), a (CV) < 10% represents a high degree of homogeneity, between 10 and 20% average and at 20% a low degree of homogeneity.

Anthropometric measurements of goalkeepers:

Table 1: Representation of the average results of the total parameters of the goalkeepers

Parameters	MIN	MAX	Average	SD	CV %
Age (ans)	20	22	21,41	0,59	2,75
Weight (kg)	57	88	72,93	6,49	8,90
Height (cm)	165	191	180,38	5,41	3,00
Wingspan (cm)	170	205	187,77	8,45	4,50

The goalkeepers present average values of ages and height respectively 21.41 ± 0.59 years and 180.38 ± 5.41 cm and coefficients of variations of 2.75% and 3.00%, which represent high homogeneity. On the other hand, the respective average values of weight and wingspan 72.93 ± 6.49 Kg and 187.77 ± 8.45 cm present an average homogeneity according to their respective coefficients of variation of 8.90% and 4.50%.

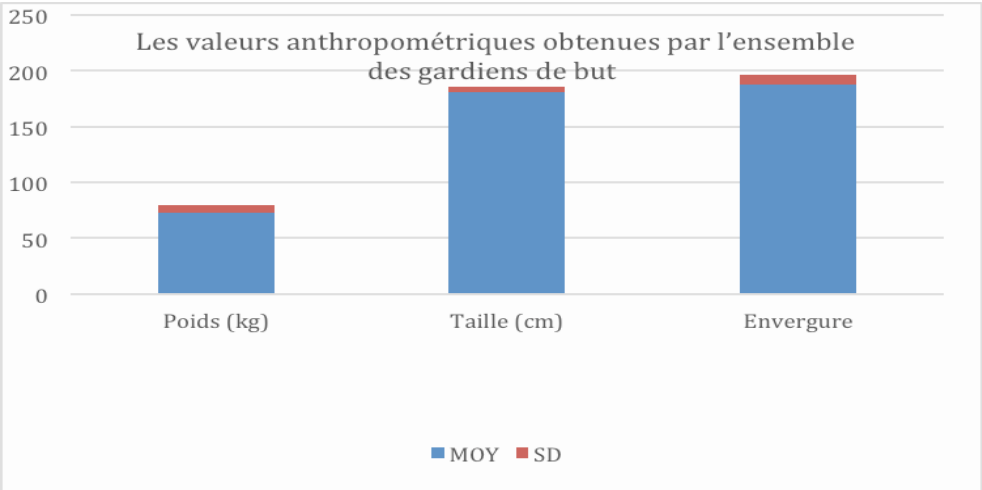

Figure 2 : Average values of total parameters of malian goolkeepers

The analysis of the average values of the goalkeepers shows a very great homogeneity of the total parameters since the coefficient of variation is less than 10%, thereby denoting a similarity of these anthropometric characters. For a better appreciation of our results we refer to the table of the study by Cazorla et al. (1998) on anthropometric measurements and physical tests, a study that allowed the development of scales of the physical value of goalkeepers.

Table 2: Values and appreciation of weight and height in goalkeepers according to Cazorla and al., (1998)

Values Kg	Assessment
64,7 à 66,3	Low mass
68,0 à 69,8	Medium mass
71,7 à 73,5	Mass fairly important
75,3 à 77,1	Important mass
79,0 à 80,8	Mass very important
82,6 à 86,3	Excellent Mass

Weight Kg

Values cm	Assessment
174,9 à 176,5	Low
178,0 à 179,4	Medium
180,8 à 182,2	Fairly high
183,6 à 185,0	High
186,4 à 187,8	Very High
189,2 à 192,0	Extremely high

Height cm

The appreciation of the weight values of Malian goalkeepers varies according to age. Malian goalkeepers have a fairly large mass compared to the data of Cazorla Et al. (1998). The height or stature of Malian goalkeepers is quite large compared to data from Cazorla Et al. (1998). Which is very important for goalkeeper practice, because it is this size and the extension of the body during games that essentially determines the height of the trigger.

Table 3: Values and appreciation of wingspan among goalkeepers according to Cazorla Et al., 1998

Values cm	Assessment
179,1 à 181,1	Small wingspan
183,0 à 184,7	Medium wingspan
186,4 à 188,1	Fairly good wingspan
189,8 à 191,9	Good wingspan

193,2 à 194,9	Very good wingspan
196,6 à 200,0	Excellent wingspan

Malian goalkeepers have a fairly good span according to data from Cazorla Et al. (1998).

Descriptive analysis of the results of the physical development indices

Table 4: Presentation of the average results of the physical development indices of goalkeepers

Indexes	MIN	MAX	Average	SD	CV %
Energy expenditure cm^2/kg	239,8	297,9	266,06	13,36	5,02
Kaup Index	1,9	2,6	2,42	0,18	7,44
Skèle Index %	106,9	139,0	123,23	7,75	6,29
IMC	18,6	52,3	23,19	5,12	22,08
Crural Index %	95,3	130,6	113,47	9,19	8,10

Energy expenditure, Kaup index, Skèle index and crural index represent high degrees of homogeneity. On the other hand, it is average for the body mass index. For a better appreciation of our results we refer to the table of classification of the human species and the study of Cazorla Et al. (1998) on length measurements, a study which allowed the development of scales of the physical value of goalkeepers.

Table 6: Values and assessment of body mass index in goalkeepers according to WHO (1997)

BMI Values	Assessment
Less than 16	Anorexia or malnutrition
16,5 à 18,5	Thinness
18,5 à 25	Normal build
25 à 30	Overweight
30 à 35	Moderatly obese (classe 1)
35 à 40	Severely obese (Classe 1)
Over 40	Morbid obesity

The Malian goalkeepers have a normal corpulence. We find that Malian goalkeepers are macroskeleton individuals.

Analysis of the performances achieved in the various physical tests by the goalkeepers

Table 8: Representation of the results of the averages and standard deviations of the performances achieved in the various goalkeeper tests

Tests	Mean	SD	Max	Min	CV%
Rebound (cm)	55,43	9,95	90,0	40,0	17,95
Power(Wattts)	4234,96	660,84	6852,20	3296,30	15,60
Number of landings	**8,15**	**1,58**	**13**	**7**	**19,39**
Distance traveled (m)	1547,69	339,46	2620	1300	21,93
VMA (seconds)	15,52	0,83	17,89	13,53	5,35
V0²max (seconds)	54,60	3,26	64,85	52,18	5,97
Speed10 m (in seconds)	1"91	0"96	2"13	1"69	0"05

The average values of the physical tests recorded in our sample are as follows: For the vertical expansion test (cm) (55.43±9.95), the power (in Watts) (4234.96±660.84), the number of stages (8.15±1.58), the distance traveled (m) (1547.69±339.46), the VMA (seconds (15.52 ±0.83)) the VO²Max (seconds (54 .60± 3.26)) and speed over 10 m (s) (1"91 ±0"96).

Table 9: Values and appreciation of triggering by goalkeepers according to Cazorla Et al., 1986

Values in cm	**Appréciations**
Under 46	Poor
50	Under medium

55	Medium
60	Good
Plus 65	Excellent

Discussion :

The various general results of certain morphology parameters of our working group, enabled us to note according to Zatsiorsky (1978), a (CV) < 10% represents a high degree of homogeneity, between 10 and 20% average and at 20% a low degree of homogeneity. Malian goalkeepers with an average height of 180.38cm represent a high degree of homogeneity. In comparison with the appreciation of the table of Cazorla Et al (1998), we note a rather large height and those of other African goalkeepers (André Onana from Cameroon with 190cm and 93kg, Edouard Mendy from Senegal with 197cm and 86kg, Raïs M'bohli from Algeria with 190cm and 80kg to name only these) are extremely tall. Today size matters more than ever in the performance of goalkeepers. The 2021-2022 Champions League final is the goalkeeper who was named best player in the final won by his team Real Madrid. With his considerable height of 199cm and 91kg made parries, detents thanks to his height and wingspan to save his team from defeat.

A tall goalkeeper lasts a lot in the post and it has become a selection criterion in other countries such as Belgium and England (Gladisheva and Nikituk, 1977). In addition to that, football has evolved enormously. It requires even more power, physics, the pace has increased, players shoot faster than before. Goalkeepers therefore have advantages. These advantages are numerous and logical, “explains Guy Martin, who trained Courtois and Koen Casteels (196cm) at Racing Genk. Catch the ball higher, dive further towards the posts, have more mass to block the ball, man against man”. This explains why many clubs and some countries have size as the number one (1) selection criterion. Chelsea, Manchester, Belgium, England. Ex-Birmingham city goalkeeper Nico Vaesen now manager of Casteels and Simois (England) starts asking about the height of the goalkeeper, if you answer 185cm he says: too small.

Conclusion :

Several complex factors determine the individual profile of the physical development of the organism and its tendencies to the formation of motor qualities. In connection with this, the morphological characteristics represent a great interest among the multiple characteristics of the individual particuliarities of the organism. According to P. Schurch (1984), morphological criteria represent the first level of performance determining factors. They are often considered as basic factors for any sports selection.

Our ambition was to contribute to the evaluation and determination of the values specific to Malian U23 goalkeepers and to propose a body of morphological knowledge specific to football. In order to assess the level of these U23 goalkeepers, it is necessary for us to determine the morphological characteristics through easily usable parameters and to identify the morphotypology of our elite.

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