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Relationship of Physical Characteristics, Mastery and Readiness to Perform with Position of Elite Soccer Players

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Abstract:

Soccer is a team sport that is defined by position. During the game, every player is assigned a definite role to play. Different positions have a specific requirement for a player to possess for effective performance. Factors such as physical characteristics, mastery, and readiness distinguish players in their respective roles. Nevertheless, for a player to fit into a particular position, combinations of two or more of these factors are necessary. This study aims to differentiate anthropometric, mastery and readiness based on the positions of elite soccer players. Two hundred and nine players with a mean age of (± 17) in positions of Goalkeepers (GK), Defenders (DF), Midfielders (MD) and Strikers (ST) were enrolled from two elite's soccer academy in Malaysia. Standard anthropometrics test was conducted, and questionnaire for achievement in mastery and performance was used to ascertain the degree of their mastery and performance. Analysis of variance revealed that there is statistically significant difference between the players in a certain position based on physical characteristics F (21,603) =1.81, P <.05. However, the follow-up test indicates that GK's are heavier and taller, compared to MF and ST p < .05 and DF are heavier and taller compared to MF p<.05. Similarly, the sitting heights of GK and DF are higher than MF p<.05. The body mass index and body fat % of GK and DF are greater than MF p <.05 .Nonetheless, no statistical difference is observed between the positions of the players and their mastery and readiness p >.05. Although both mastery and readiness to perform remained the same p >.05, physical characteristics differentiate elite's soccer players on the role they play in the game.

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1. Introduction

Soccer is regarded as the most developed and popular sport in the world. Over the recent years, the game of soccer has metamorphosed from simply attractive sport to the most essential accepted and widely played games all over the world. The simplicity of the game and the rules made it, even more, appealing worldwide. The game can be played in generally every surface such as grass, clay, asphalt, concrete, parquet, and sand either open or closed [1]. The game is played by two teams of eleven players each. Different positions define the game, and every player in a team has a particular role to play. Each player position has a specific task from defending against opponents, building attacks or scoring. The player's positions are categorized into four namely; defenders, who are saddled with the responsibilities to prevent their opponents from scoring, midfielders, are expected to serve as a link between defenders and strikers that is to defend as well as to attack. Strikers are anticipated to score goals and a goalkeeper have a unique position to guard the net, and he is the only player allowed to play with his hands provided that he is within his penalty area, and the ball was not intentionally passed to him by a teammate.

For the attainment of favorable results in soccer, there is a need for one to be acquainted with the scientific nature, characteristics as well as the influence of individual factors that determine success in the game. A physical characteristic is a description of overall physique about body shape and composition of body size. Physical characteristics have been identified as one of the frequently utilized methods for analyzing nature of body build. Due to its importance, physical characteristics have been used to study several aspects of sports and exercise science which can be useful in mapping out talented athletes for a particular sport. To date; coaches have perceived the importance of a scientific approach to monitoring and evaluating athletes for the successful performance of their sporting career [2]. Typically, however, coaches strive to find certain attributes from a player to help them decide which position is best to play him for the successful enactment of the game. Certain variables such as age, body mass and body mass index have been currently discovered between elites soccer players of varying positions predicting that players of certain size and shape may be appropriate for the needs of the variety of positions [3].

Vestberg et al. [4] reported that elite professional soccer is a complex sport, and its successful performance can be influenced by some factors such as physical, physiological and psychological. They stressed that throughout the most recent couple of years, the part of psychology in professional soccer clubs has been fully recognized. Professional soccer clubs such as Derby County in English premier league and Ajax football club in Holland have not only opened doors for psychological assessment in their team but have shown how it can help improve player performance. However, previous studies have concentrated on the effects of psychological factors on performance and emphasized that application of sports psychology plays a significant role in influencing performance in soccer [5, 6].

The Task and Ego Orientation Questionnaire in Sport (TEOSQ) was developed primarily to assess athlete's proneness for task and ego involvement in the sporting context [7]. Task orientation predicts mastery of certain skills while ego explored readiness to execute the skills mastered. It has been proving that task oriented player is recognized by higher persistence, interest, and enormous effort. Duda [8] affirmed that task orientation is the ability of a player to show readiness and confidence to execute certain skills. The task oriented player works for the mastery of skills and enjoys the feeling of self-motivation and confidence. Ego orientated player in the other hand shows that he is the best and views his performance as better compared to others. The primary aim of the ego-oriented player is to outperform his opponent. It is beyond gaining mastery over a skill and makes personal improvements. For example, an ego-oriented player will try to outplay his opponent either by pushing the ball fast ahead of the opponent or by stopping the opponent from receiving a pass from his teammate. Likewise, task oriented player masters his skills and exhibits it freely and with ease. Soccer is a complex sport that requires physical prowess, decision making and mental readiness. A combination of

elements such as physical fitness, mastery and the willingness to play may be essential in contributing to excellence performance in the game. However, different positions require specific attributes for a player to possess to perform better. These Factors could distinguish players in their respective roles. The purpose of this study is to investigate the relationship of physical fitness, mastery (task), and readiness to perform (ego) with the position of elite soccer players.

2. Materials and Methods

A total of two hundred and seven players with the mean age of (± 17) were recruited to participate in this study. The players were of different positions which in include Goalkeepers (n=20), Defenders (n=78), Midfielders (n=71) and Strikers (n=40) drawn from two elite soccer academy in Malaysia (Bandar penawar and Bukit jalil). The coaches and the managers of the academies were informed about the purpose of the research. Writing approval was obtained, and all the players signed consent forms. Standard anthropometric tests were conducted which constitutes of weight, height, sitting height, body fat % and body mass index. Questionnaire for achievement in mastery and performance (TEOSQ) developed by Duda [8] was used to ascertain the degree of their mastery and readiness to performance.

2.1. Measurements and Measuring Techniques

Five anthropometric parameters were evaluated namely; body height, weight, sitting height, body fat percent and body mass index (BMI). Skin fold was used to measure the triceps, abdomen, upper arm circumference, flexed calf circumference, elbow diameter and knee diameter. From these characteristics, the body mass index was then computed by dividing the body mass (kg) and body height square (m^2), as suggested by Carter and Goulding, [9]. All the measurements were executed in accordance with ISAK protocol Stewart et al. [10]. The measurements were obtained twice, and the mean value was generated as the final score.

2.2. Statistics:

Multivariate analysis of variance (MANOVA) was used to analyze the data collected. The positions of the players were used as the independent variables while the responses of the players on task and ego orientation questionnaire administered as well as the anthropometric parameters were used as the dependent variables. All the inferences were set at a confidence level of $p \leq 0.05$. The statistical analysis was conducted using SPSS version 20 for windows.

3. Results

Table 1 shows the descriptive statistics for all the variables computed. The number of variables examined the different positions of the players, the mean, the standard deviation and the total numbers of the players are displayed.

Table 1: Descriptive statistics

Variables	Position	M	SD	N
Task	GK	61.85	5.51	20
	D	60.27	8.60	78
	M	58.56	7.80	71
	S	59.98	7.17	40
	Total	59.78	7.83	209
Ego	GK	35.00	10.26	20
	D	31.85	11.66	78
	M	32.75	10.25	71
	S	34.20	10.58	40
	Total	32.90	10.84	209
Weight	GK	63.01	10.06	20
	D	59.04	9.27	78
	M	53.24	8.47	71
	S	55.41	8.89	40
	Total	56.75	9.50	209
Height	GK	170.83	7.02	20
	D	168.07	7.81	78
	M	163.53	7.95	71
	S	164.99	7.51	40
	Total	166.20	8.06	209
Sitting Height	GK	89.18	5.60	20
	D	88.09	4.02	78
	M	85.16	7.07	71
	S	86.76	4.61	40
	Total	86.95	5.63	209
BMI	GK	21.51	2.60	20
	D	20.78	2.18	78
	M	19.78	2.18	71
	S	20.23	2.25	40
	Total	20.40	2.29	209
% of BF	GK	31.91	11.08	20
	D	29.84	10.83	78
	M	25.82	5.02	71
	S	27.89	6.06	40
	Total	28.30	8.62	209

Table 2 shows the inferential statistics. It points out that there is statistically significant difference between the positions of the players based on the parameters measured.

Table 2: Inferential Statistics

	df	Error	F	Sig
Pillai's Trace	21	603	1.81	.015*

*Significant at $p < 0.05$

Table 3 shows the pairwise comparison conducted as a follow-up in relation to the variables evaluated. From the table, the variables examined, the positions of the players, the mean, the standard error as well as the p-value are shown. However, it can be observed that there is no statistically significant difference between the task and all the positions of the players ($p > 0.05$). Similarly, no statistical difference is observed between the ego and all the position of the players ($p > 0.05$). Moreover, the table projects that there are differences based on the positions of the players and their physical characteristics i.e. weight, height, sitting height, body mass index (BMI) and body fat % ($p < 0.05$).

Table 3: Pairwise comparison between the groups

Variables	Position	M Diff (I-J)	SE	*P*
Task	GK vs DF	1.581	1.960	1.000
	GK vs MF	3.287	1.980	0.590
	GK vs ST	1.875	2.142	1.000
	DF vs MF	1.706	1.283	1.000
	DF vs ST	0.294	1.521	1.000
	MF vs ST	-1.412	1.546	1.000
Ego	GK vs DF	3.154	2.722	1.000
	GK vs MF	2.254	2.750	1.000
	GK vs ST	0.800	2.975	1.000
	DF vs MF	-0.900	1.782	1.000
	DF vs ST	-2.354	2.112	1.000
	MF vs ST	-1.454	2.147	1.000
Weight	GK vs DF	3.976	2.258	0.478
	GK vs MF	9.775*	2.280	0.000
	GK vs ST	7.603*	2.467	0.014
	DF vs MF	5.799*	1.478	0.001
	DF vs ST	3.627	1.752	0.238
	MF vs ST	-2.172	1.781	1.000
Height	GK vs DF	2.759	1.938	0.936
	GK vs MF	7.299*	1.958	0.001
	GK vs ST	5.845*	2.118	0.038
	DF vs MF	4.539*	1.268	0.003
	DF vs ST	3.086	1.504	0.249
	MF vs ST	-1.454	1.529	1.000
Sitting Height	GK vs DF	1.085	1.374	1.000
	GK vs MF	4.017*	1.388	0.025
	GK vs ST	2.420	1.502	0.652
	DF vs MF	2.932*	0.899	0.008
	DF vs ST	1.335	1.066	1.000
	MF vs ST	-1.597	1.084	0.853
BMI	GK vs DF	0.735	0.560	1.000
	GK vs MF	1.736*	0.566	0.015
	GK vs ST	1.280	0.612	0.227
	DF vs MF	1.001*	0.367	0.041
	DF vs ST	0.544	0.435	1.000
	MF vs ST	-0.457	0.442	1.000
% of BF	GK vs DF	2.067	2.112	1.000
	GK vs MF	6.089*	2.133	0.029
	GK vs ST	4.020	2.308	0.498
	DF vs MF	4.022*	1.382	0.024
	DF vs ST	1.953	1.639	1.000
	MF vs ST	-2.069	1.666	1.000

*Significant at $p < 0.05$

4. Discussion

The purpose of this study was to examine the relationship of physical fitness, mastery, and readiness to perform with the position of elite soccer players. The findings revealed that there are significant differences between the positions of the players and their bodily characteristics. The study shows that that GK's are heavier and taller, compared to MF and ST $p < .05$ and DF are heavier and taller compared to MF $p < .05$. Similarly, the sitting heights of GK and DF are higher than MF $p < .05$. The body mass index and body fat % of GK and DF are greater than MF $p < .05$. However, there are no differences observed between the players based on their mastery and readiness to perform $p > .05$.

The finding of this study revealed that elite soccer players possessed different characteristics based on the demands of their respective positions. From the study, it is observed that goalkeepers are taller and heavier compared to midfielders and strikers. The result is consistent with the study conducted by Hazir, [11]; Grgantov and Erceg, [12]. Also, a study carried out by Brahim et al. [13] has shown that goalkeepers were importantly taller and possessed higher body mass than their teammates playing other positions. Therefore, it is not surprising that many young soccer players were selected for the goalkeeping role at the initial stage of their training due to their superior height and body mass in comparison to the players in other positions. It can further be explained that goalkeepers are selected in their position not because they have more skills compared to others but simply because they are not basically as fitter as the players in the other positions.

Moreover, the findings of the current study discovered that defenders are significantly taller and heavier in comparison to midfielders. The finding explained that the physical requirement for the elite soccer players in the position of defenders was attributed to being bigger and taller as opposed to midfielders. This finding is congruent with the study conducted by Ahmad [14] in which he reported that due to the task attributed to the position of defenders in guarding their side and marking their opponents, they tend to be heavier as well as taller to enable them to discharge their responsibilities effectively. Similarly, the finding of this study indicated that strikers are lighter and smaller than players from the other positions. This is in agreement with the study conducted by Martínez et al. [15] which affirmed that forwards tend to be lighter because they are faster and may be required to run long distances during a match day.

In another development, the current study revealed that both mastery and readiness to perform remained unchanged among players in all positions. It implies that mental skills and motivation are required across all the positions in elite soccer players. According to Najah and Rajeb [16], a variety of skills are expected to be played in different positions of elite soccer players through the association of both mastery and readiness in respective of which position a player plays.

5. Conclusions

Success in the game of soccer is attributed to factors such as physical characteristics, mastery and the readiness to play. The findings of this study observed that a certain representative profile associates each position in elite soccer players for a better delivery of performance. The present study also revealed that there are variations of physical characteristics for playing positions, with taller and heavier players tended to be more suitable for goalkeepers and defenders, while smaller and lighter players are more appropriate to strikers. Similarly, the study observed that both mastery and readiness to play remained the same among elite soccer players of different positions. Therefore, it can be concluded that both mastery and readiness to perform are expected to be possessed by elite soccer players of varying playing positions. Coaches, team managers, and scouting crew might find this study suitable for a guide to the selection of players for talent identification.

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