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Research paper



Dispositional of Goal Orientation in Soccer Player Performance on Different Position

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Abstract

This study investigates dispositional of goal orientation in player performance on different positions. Data were obtained from 223 participants in a research aged 13 to 17 years old in Malaysia. Data interpretation was carried out using cluster analysis (CA) and discriminant analysis (DA). Players completed the Task and Ego Orientation in Sport Questionnaire (TEOSQ) and physical fitness test (v sit-up, agility, speed 5m, 10 and 20m, sergeant jump, sit and reach). CA was applied on motivation orientation which divided group according to their homogenous and DA was use for psychology that determine differences on player performance in different soccer positions. CA projected three groups form known as HTHE, LTME and MTLE and DA successfully discriminate three groups on 13 independent variables with 79.82% (forward stepwise) with total of 67 potential players. Each dispositional groups of goal orientation tend to show specific characteristics, attribute of soccer performance and physiological capacity. Finding of this study show insight of motivational dispositional characteristic lead to discrepancies of soccer performance and characterize the suitable players on each position in soccer.

Keywords: *Cluster Analysis; Discriminant Analysis; Goal Orientation.*

1. Introduction

Soccer is the most popular team sport worldwide. To succeed in soccer, players need to have an optimal combination of a variety of factors including specific body size and composition, physical fitness (aerobic and anaerobic) skill, behavioral dimensions, and a sense of the game, labeled as 'game intelligence' [1-2]. Their statement has been supported by others research that physical fitness supported by five types of components namely endurance of the heart system (aerobic increase), the body composition of muscular endurance, muscle strength and flexibility [3]. Physical fitness plays an important role in contributing to the achievement of players in sports [4]. Every soccer player needs to put some pressure into few components based on physical fitness to create energy, precision, balance, body stability and defense that enough. To make sure the component in the high level along entire season is a need to reach higher quality performance that consistent [5].

The research on motivation brings up that the players should be motivated from two main sources, which group the most explicit explanations about their motives. First, they may be motivated intrinsically, that is they do sport activities for pleasure, fun or others self-determined reasons. Second, they may have been motivated by extrinsic factors: obtaining benefits, as tangible and material such money or trophies, or social rewards (prestige, public knowledge), or to avoid punishment [6]. Goal orientation is a determinant factor of player's success in sport [7]. To achieve this goal, psychological factors such as goal orientation, concentration and anxiety must be well controlled to produce the best performance. When the competition becomes more intense, greater mental resilience is required because motor skills gaps among players today are getting smaller. Success and failure in sports, especially golf is often associated with motivation, attention and arousal. Thus, the mental preparation for players before and during the competition is very important [7].

Insufficient service from sport psychologists in many sport associations in Malaysia shows that this mental and psychological aspect is not given serious attention by the related parties. There is not enough psychological training for all players in order to improve their mental strength. When they are defeated in competition, there is no scientific research analysis or detailed report on that particular part, except only general report in local newspaper. This shows that research or documentation in sport psychology is still lacking in Malaysia [7]. The aim of this study is to investigate dispositional of goal orientation on player's performance in different soccer position.

2. Materials and Methods

2.1. Players

The anthropometric measurement and physical test data in this study was obtain from 223 male adolescent players (17.38±1.92 years). The subject is recruited from all around Sport School in Malaysia that specialized in soccer to develop more of their talent. These players have been chose to participate in the research because it has been claim as the best in their state for less than 21 years old. These age groups were chosen suggesting that participation motives and achievement behavior changes around this age. Coaches and managers have been informing ahead about the purpose of the research. Writing approval was obtained and all players signed consent forms.

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2.2. Anthropometrical Measurement

Anthropometrical measurement for the assessment of physical component included two measurements namely weight, height, sitting height, and arm span. Height was measured with a wall mounted wooden stadiometer to the nearest 0.5 cm; weight was measured in weighing scale in kg. Arm span was measured from fingertip to fingertip while back flat on the wall and arm stretched with the palm facing investigator. The equipment required consisted of the measuring tape at the wall, measured in centimeter (cm).

2.2.1. Physical Fitness

Players did V sit-up test that when knees bending at 90 degrees. The number completed sit ups in 1 minute recorded.

2.2.2. Flexibility

The flexibility of the lower back and hamstrings were determined by the sit and reach test. The players performed two trials, and the best one was recorded for further analysis as suggested by the previous researchers [8]. The flexibility of the lower back and hamstrings were measured by sit and reach (S&R) test. Players perform two trials and the best one was recorded for further analysis.

2.2.3. Speed Test

Linear sprint speed was evaluated over 20 m. After a standardized warm-up, the test conducted over 20 meters. The starting position should standardize, starting from a stationary position with a foot behind the starting line, with no rocking movements. Using timing gate, time to run each split distance were measured (20m) during the same run then acceleration and peak velocity also determined. The subjects were told to keep up the maximal pace until passing the marker on which the mentor stood. The execution times were recorded situated on 5, 10 and 20 m respectively [14].

2.2.4. Endurance Capacity Test

The maximal multistage 20-m shuttle run test was used to evaluate maximal aerobic capacity from maximal aerobic speed. Players keep running for whatever length of the time he could afford until no more keep pace with velocity of the tape. VO_2max (ml/min/kg) was expressed in ml of oxygen consumed per kilogram of body weight and per minute. During the test, the participants were verbally, encouraged to run as long as possible.

2.2.5. Soccer Specific Skills Test

Run with ballplayers need to run as fast as possible while dribbling the ball. Fewer balls touch the feet of player but it generally faster, but must control the ball. Soccer specific skill tests were executed to acquire technical skill characteristics by applying from the previous studies namely F-MARC test accompanying to measure skill test namely dribbling with and without a ball, ball control using three different part of a body, short pass, long pass, shooting with foot and score using head [17]. Player only gets 3 attempts. Long passing one of the tests in soccer skills test which player needs to stand to the line at opposite end and take a turn to hit the ball passed to opposite side playing area. Shooting from passing player need to scores as many as possible, another player need pass the ball and player need to take a shoot to the goal while the ball is moving. Heading when player head the ball into the goal with accuracy and power.

2.3. Study instrument

2.3.1. Motivational Test

Task and Ego orientation in Sports instrument (TEOSQ) was adopted in this study. The questionnaire contains 13 items which measured player's disposition to being task or ego oriented in sports. Questionnaire has been translating to Bahasa Malaysia using back-translation method and it robust the reliability in the sports fields. Task and ego orientation subscale demonstrated adequate internal consistency with alpha reliability coefficients of 0.82 and 0.71 respectively. This instrument contains six items that assess the ego components (such as "I can do better than my friends") and seven items assess the task components (such as "I work hard"). Feedback is shown on 5 points of the Likert type scale where 1 strongly disagrees and 5 strongly agree [16].

2.4. Data analysis

2.4.1. Cluster analysis

In this study, hierarchical agglomerative cluster analysis HACA was assign to identify grouping of the motivation orientation from task and ego. Hierarchical agglomerative cluster analysis (HACA) was applied to isolate the classes of the relevant performance variables measured [15]. The study has use HACA to make the result much more robust and effective. HACA has identified and categorized each sample to their similarities of components and subject into clusters. Thus, using ward method utilizing Euclidean distance has shown very effective technique. The finding has been clarified by dendrogram and has been divided according cluster and their closeness.

2.4.2. Discriminant analysis

The discriminant analysis (DA) controls the variables that separate among two or more clearly joined group/clusters. DA was applied in this study to ascertain whether the groups vary with respect to the mean of a variable and to utilize that variable to predict group membership [8]. DA was conducted from results of HACA for validation of test and separates other variable according to cluster that have significant that contribute in different cluster. Three groups were assigned selected and obtained from HACA for relative performance (three sampling known as HTHE, LTME and MTLE). The physical performance was put into raw data using standard, backward stepwise, and forward stepwise methods. These were used to construct DFs to evaluate physical fitness and motivational performance. Similarly, in the forward stepwise mode, variables are counted in step by step starting with the utmost significant variable until no significant changes were obtained. In the backward stepwise mode, variables are removed step by step beginning with the less significant variable until no significant changes were obtained. DA was formulated using below equation.

$$f\ (G_i) = k_i + \sum_{j=1}^{n} w_{ij} P_{ij}$$

where *i* is the number of groups (G), *ki* is the constant inherent to each group, *n* is the quantity of parameters utilized to categorize a set of data into a certain group, and *wj* is the mass coefficient assigned by DF analysis (DFA) to a given parameter (*pj*).

3. Results and Analysis

Table 1 shown descriptive statistic of the players. It shows total of number of the players drawn from different soccer position. The minimum, maximum, mean, and standard deviant of players performance on each battery test are projected.

Table 1: Descriptive statistic of soccer players performance (n = 223)

Variables	Min	Max	Mean	Sta. dev.
Weight (kg)	26.9	90.5	56.5	9.5
Height (cm)	128.6	190.6	166.1	8.0
Sitting Height (cm)	38.6	98.4	86.9	5.6
Biceps (%)	2.8	12.3	4.1	1.1
Triceps (%)	4.5	24.8	7.8	2.3

Subscapular (%)	4.5	28.8	8.3	2.3
Suprailiac (%)	4.5	45.4	8.1	3.6
MUAC (cm)	2.3	34.6	24.7	2.9
CC (cm)	3.7	44.0	34.9	3.6
Maturity	1.0	5.0	3.8	0.8
Flexibility	0.0	27.0	13.2	5.2
Leg Power (cm)	2.7	198.0	64.3	14.8
Body strength	2.0	7.0	5.9	1.0
Agility (s)	1.6	3.0	2.4	0.3
Speed 5m (s)	0.4	1.6	0.8	0.2
Speed 10m (s)	1.0	2.2	1.5	0.2
Speed 20m (s)	1.5	4.1	2.9	0.3
Fatigue Index (s)	-1.6	6.4	0.5	0.8
VO_2max (ml/kg/min)	29.9	63.7	47.4	7.7
Run w/ball (s)	1.9	7.6	4.6	1.1
Juggling (foot)	5.0	52.0	38.8	11.2
Juggling Body	3.0	9.0	7.4	2.0
Speed Dribbling	16.9	29.3	21.0	2.3
Long Passing	0.0	12.0	3.9	2.8
Short Passing	1.0	15.0	10.0	3.5
Shooting TRC (Dead Ball)	0.0	18.0	3.7	2.9
Shooting TLC (Dead Ball)	0.0	13.0	3.6	2.9
Shooting from a Pass (Foot)	0.0	26.0	8.2	5.6
Heading (mid-post)	0.0	18.0	9.0	4.5
Heading (side-post)	0.0	18.0	7.3	4.2
Task	17.0	70.0	59.8	7.7
Ego	6.0	58.0	32.9	10.9

Table 2 shows the classification of the group prediction using different type of DA. Based on the output of the CA, group classification was confirmed by DA. DA has done by using three methods which is predefined mode, backward stepwise and forward stepwise. Accurate changes in youth soccer performance by Confusion Matrix through predefined mode, backward stepwise and forward stepwise is 76%, 76% (14 significant independent variables) and 80% of validation (13 significant independent variables) respectively.

Based on result, stepwise mode cross validates the group classification and it is highlighted that 84 players are isolated to HTHE, 93 players in LTME and 46 players in MTLE. Similarly, box and whisker plots of projected the goal orientation groups differences based on the significant parameters furthering using forward stepwise mode as shown in Figure 3.

Table 2: Classification matrix of Discriminant Analysis (DA) for the relative performance variations on three different groups

Sampling Groups	% Correct	Group Assigned by DA		
		HTHE	LTME	MTLE
misclassified mode				
HTHE	41.0%	32	33	13
LTME	45.1%	29	41	21
MTLE	27.8%	19	20	15
Total	39.5%	80	94	49
Predefined mode				
HTHE	85.0%	68	4	8
LTME	78.7%	11	74	9
MTLE	57.1%	10	11	28
Total	76.2%	89	89	45
Backward stepwise (14 independent variables)				
HTHE	83.8%	67	5	8
LTME	77.7%	11	73	10
MTLE	61.2%	10	9	30
Total	76.2%	88	87	48
Forward stepwise (13 independent variables)				
HTHE	83.8%	67	5	8
LTME	85.1%	7	80	7
MTLE	63.3%	10	8	31
Total	79.8%	84	93	46

Based on Table 3, dispositional goal orientations on player performance in defender position shown that defender tends to be in HTHE for goal orientation, defender excellence in V sit-up, running with ball, juggling body, long passing, shooting TL and shooting from passing with the higher scores compare to others.

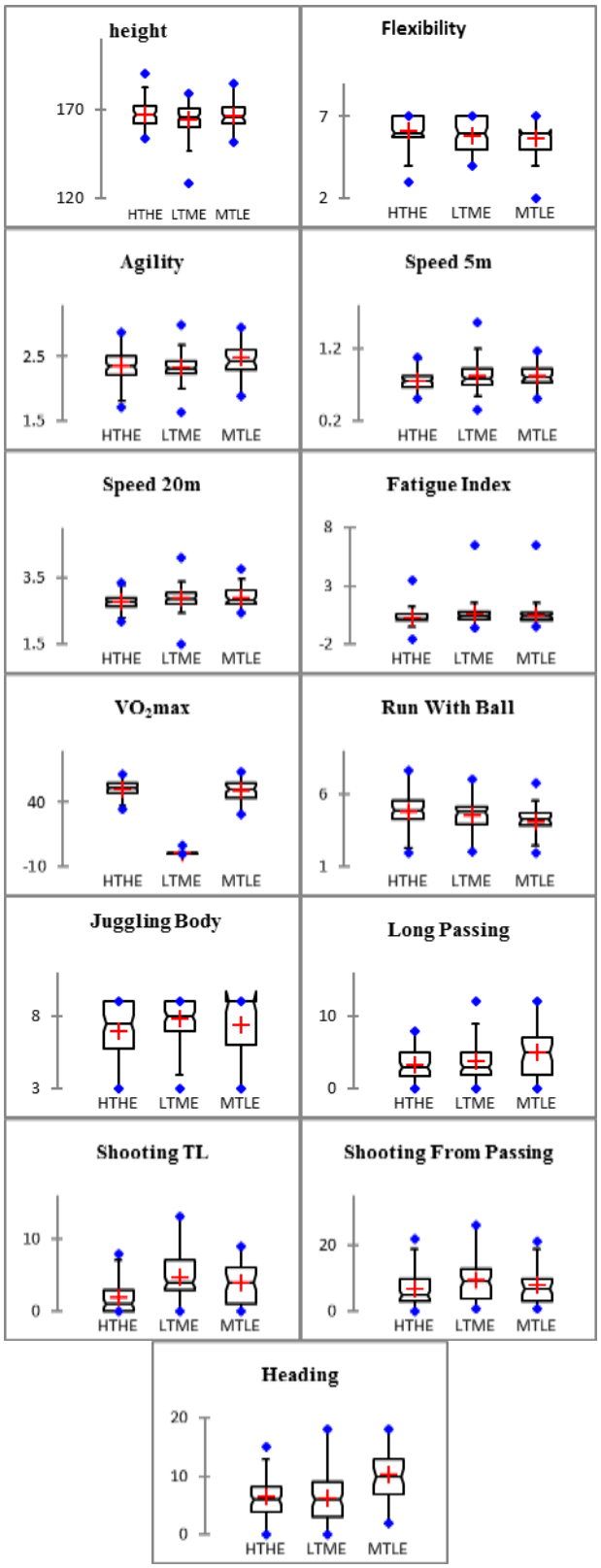

Fig 3: Box and whisker plots based on forward stepwise in DA

Table 3: Dispositional of goal orientation on player performance profile in defender position based on 13 significant parameters

Parameters	Statistic	HTHE (n = 26)	LTME (n = 30)	MTLE (n = 26)
Height (cm)	Range	160.4-184.6	154.1-190.6	139-181.1
	M(SD)	168.7(6.1)	168.6(7.1)	167.2 (9.0)
V- Sit up (rep)	Range	3.0-7.0	4.0-7.0	5.0-7.0
	M(SD)	5.9 (1.1)	6.2(0.8)	6.2 (0.7)
505 A (s)	Range	1.7-2.8	1.64-2.98	1.71-2.88
	M(SD)	2.3(1.3)	2.4(1.1)	2.4(1.0)

Speed 5m	Range	0.4-1.0	0.6-1.1	0.6-1.0
	M(SD)	0.7(0.2)	0.8(0.1)	0.8 (0.1)
Speed 20m	Range	1.5-3.3	0.6-1.1	2.2-3.4
	M(SD)	2.8(0.3)	0.8 (0.1)	2.8(0.2)
FI	Range	0.6-2.7	2.5-3.7	-0.4-1.5
	M(SD)	0.3(0.6)	2.9(0.2)	0.5(0.4)
VO_2max (ml/min/kg)	Range	30.6-57.9	-0.5-3.3	34.3-59.0
	M(SD)	48.2(6.2)	0.5(0.7)	48.7(7.1)
Running with ball (point)	Range	2.3-6.1	30.6-58.7	2.1-5.6
	M(SD)	4.5(0.9)	43.4(58.7)	4.3(5.6)
Juggling Body (point)	Range	3.0-9.0	3.0-9.0	3.0-9.0
	M(SD)	6.8(2.2)	7.7(1.8)	7.0(2.3)
Long passing (point)	Range	0.0-12.0	0.0-10.0	0.0-11.0
	M(SD)	4.2(2.8)	4.1(2.6)	4.2(2.9)
Shoot TLC (point)	Range	0.0-12.0	0.0-13.0	0.0-9.0
	M(SD)	3.6(3.1)	4.1(3.0)	3.4(3.0)
Shooting from pass (point)	Range	0.0-25.0	3.0-22.0	1.0-26.0
	M(SD)	7.19(6.29)	8.3(5.1)	8.1(4.3)
Heading (point)	Range	0.0-12.0	0.0-14.0	1.0-26.0
	M(SD)	6.7(3.7)	6.8(3.4)	8.5(4.3)

Table 4 shows DA of midfielder on table and box and whisker plots, results highlighted that midfielder scores the most in physical fitness and soccer skills. As results show that midfielder tend to group in LTME for goal orientation. Their performance parameters as describe excellence in agility, speed 5m and 20m, fatigue index, VO_2max, running with ball, long passing, shooting TLC, and heading.

Table 4: Dispositional of goal orientation on player performance in midfielder position based on 13 significant parameters

Parameters	Statistic	HTHE (n = 26)	LTME (n = 37)	MTLE (n = 16)
Height (cm)	Range	128.6-174.2	144.0-175.40	146.7-175.1
	M(SD)	163.6(9.4)	162.2(6.4)	165.4(7.2)
V- Sit up (rep)	Range	5.0-7.0	3.0-7.0	4.0-7.0
	M(SD)	6.0(0.9)	5.6(1.0)	5.7(0.9)
505 A (s)	Range	1.8-2.8	1.8-1.3	2.2-1.1
	M(SD)	2.3(0.2)	2.4(0.3)	2.4(0.2)
Speed 5m (s)	Range	0.5-1.1	0.5-1.3	0.6-1.1
	M(SD)	0.7(0.1)	0.8(0.2)	0.8(0.1)
Speed 20m (s)	Range	2.4-3.4	2.3-4.1	2.6-3.4
	M (SD)	2.8(0.3)	2.9(0.3)	2.9(0.3)
FI (s)	Range	-1.55-0.95	-0.34-6.43	-5.3-1.36
	M(SD)	0.1(0.5)	0.6(1.1)	0.2(0.5)
VO_2max (ml/min/kg)	Range	37.5-58.7	29.9-63.7	35.4-62.7
	M(SD)	50.3(5.8)	47.6(7.6)	47.4(8.3)
Running with ball (s)	Range	2.0-5.8	2.1-6.7	2.0-5.7
	M(SD)	4.6(1.2)	4.5(1.0)	4.2(1.2)
Juggling Body (point)	Range	3.0-9.0	3.0-9.0	5.0-9.0
	M(SD)	8.0(1.7)	7.5(2.0)	8.5(1.0)
Long Passing (point)	Range	0.0-9.0	0.0-12.0	0.0-10.0
	M(SD)	3.7(2.2)	3.8(3.1)	4.6(3.1)
Shooting TL (point)	Range	0.0-7.0	0.0-12.0	0.0-9.0
	M(SD)	2.7(2.4)	4.0(3.1)	3.9(2.3)
Shooting from passing (point)	Range	0.0- 21.0	1.0-22.0	2.0-14.0
	M(SD)	9.2(5.4)	9.6(5.8)	7.1(3.4)
Heading (point)	Range	0.0-18.0	0.0-18.0	3.0-18.0
	M (SD)	6.6(4.5)	6.6(4.0)	9.3(4.0)

Results on Table 5 show that most of forward position has an MTLE in goal orientation. Forward perform better in soccer skill compare with physical fitness. It also shows excellence in running with ball, long passing, shooting from passing, and heading.

Table 5: Dispositional of goal orientation on player performance in forward position

Parameters	Statistic	HTHE (n = 16)	LTME (n = 18)	MTLE (n = 11)
Height (cm)	Range	157.0-172.8	133.0-177.5	155.4-175.5
	M(SD)	166.5(4.4)	164.6(9.1)	164.3(7.1)
V- Sit up (rep)	Range	5.0-7.0	4.0-7.0	4.0-7.0
	M(SD)	6.1(0.9)	5.8(0.8)	5.4(1.0)
505 A (s)	Range	2.2-2.8	1.9-2.6	1.8-2.8
	M(SD)	2.5(0.2)	2.3(0.2)	2.4(0.3)
Speed 5m (s)	Range	0.5- 1.6	0.6-1.1	0.7-1.1
	M(SD)	0.8(0.2)	0.8(0.2)	0.9(0.1)
Speed 20m (s)	Range	2.3- 3.4	2.2- 3.4	2.7-3.3
	M(SD)	2.8(0.3)	2.8(0.3)	3.0(0.2)
FI (s)	Range	-0.84-6.43	-0.34-3.49	-0.99-2.93
	M(SD)	49.5(6.4)	47.3(6.7)	52.0(7.3)
VO_2max (ml/min/kg)	Range	37.1-58.2	31.4-57.9	38.2-63.7
	M(SD)	49.5(6.4)	47.3(6.7)	52.0(7.3)
Running with ball (s)	Range	4.1-7.0	2.5-6.4	2.0-7.6
	M(SD)	5.1(0.9)	4.6(0.9)	4.7(1.5)
Juggling Body (point)	Range	3.0-9.0	3.0-9.0	3.0-9.0
	M(SD)	7.5(1.7)	7.3(1.8)	6.4(1.9)
Long Passing (point)	Range	0.0-7.0	0.0-7.0	0.0-11.0
	M(SD)	3.2(2.5)	3.4(2.2)	4.2(3.5)
Shooting TL (point)	Range	0.0-10.0	0.0-7.0	0.0-9.0
	M(SD)	2.4(2.8)	4.6(2.0)	5.0(3.0)
Shooting from passing (point)	Range	1.0-16.0	2.0-19.0	1.0-21.0
	M(SD)	6.5(4.3)	8.5(5.3)	9.2(8.0)
Heading (point)	Range	0.0-15.0	1.0-18.0	3.0-18.0
	M(SD)	8.1(4.7)	8.1(4.5)	9.7(4.3)

4. Discussion

The results obtained from current study implies that weight, height, sitting height, arm span, 10-meter run, 20-meter run predicted VO2 max and sit and reach were found to be most significant variables for identifying motivation orientation on different soccer position. Results from HACA provided obtained among the male sedentary youth involved in this study. From the CA it has shown that cluster with a high task and high ego performs well in anthropometric measurement and tactical performance.

The results of the current study from MTLE groups revealed that the group perform well in physical fitness and have higher muscular strength compare to others. Examined goal orientation profiles of male rugby players and indicated that moderate task/high ego profile resulted in a perception of better physical abilities [9]. This finding is in agreement that players required upper muscle strength which helps to sustain sports activities, especially sports that required the utilization of upper extremities for a long period of time. Moreover, on the same group shows the higher endurance that's proving players can sustain sporting activities for longer duration without showing any sign of undue fatigue. However, the finding from this group also indicated that the group is recognized by higher core muscles strength as opposed to the other groups. Core muscle strength is the ability of the abdominal muscles to sustain frequent activation without getting fatigue quickly [5].

The finding from HTHE reveals that the group attributable to high capacity in cardiovascular endurance. Suggested that individual with the high task and high ego orientations would display an adaptive goal profile enabling them to meet the demands of competition. From the previous study showing that cardiovascular endurance help players in carrying out their activities much more time than needs [10]. This group also reflect a higher self-confidence hence players doesn't fell intimidate or fear through their opponent. At a higher athletic level of performance, self-confidence contributes to the success of players which also determine whether players can give up or remain focused on their objectives after a series of setbacks [5]. Thus, HTHE showed flexibility as the features to belonging players. Flexibility refers to the

capability of the muscles at a joint to extend to their fullest capacity and consequently return to the normal status with a considerable ease [5]. This is because the players can perform action much more freely but also can reduce a cause of injury to the muscle.
The results shown of LTME reveal that groups have great physical fitness and excellence in soccer skills but lack goal orientation. This result is similar to the previous study which indicated that cardiovascular endurance provides players with energy to carry out their sporting activities with vigor [11]. Cardiovascular endurance is an important fundamental attribute of athletic performance since the heart controls the oxygen flow to all the working muscles [12]. This finding is in concord with the previous study which reported that players can succeed in their sports when they have an adequate level of ego to perform. Equally, when they feel unsure of themselves, the slightest setback or smallest obstacle can have an undue effect on their performance. Similarly, the finding corresponds with that of Davies and colleague who revealed that ego is the certainty of feeling that you are equal to the task at hand [13].

5. Conclusion

The aim for this study is to identify relationship between goal orientations of 223 male soccer players that has been train as next coatings in soccer. The test that the players take are physical fitness parameter (push up, V sit up, sit & reach, sergeant jump, and speed) and the players respond to TEOSQ instrument (ego and goal orientation). Current study applied multivariate analysis which is HACA and DA to study motivation orientation on different soccer position. The HACA identified three group based on ego and task parameter with performance parameters in examined in this study. These group calls as HTHE, MTLE and LTME respectively. DA identified 13 parameters combine with ego and task orientation that differentiate all the groups. Thus, every player with HTHE results in ego and task orientation based on the player performance and goal orientation can trains players more in order to improve the achievement of sports and goal orientation. This concludes that player with different goal orientation results give different performance on different positions in soccer. Better goal orientation has better performance and it specific on position and gives other beneficial on positions.

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