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Original scientific paper

Morphological characteristics and health related physical fitness in Ethiopian youth sports academy female soccer players

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ABSTRACT: *The purpose of this study was to describe the morphological characteristics and health related physical fitness in Ethiopian youth sports academy female soccer players. The cross- sectional study design was used. The total of one hundred two youth female soccer players were selected using purposive sampling technique from Ethiopia three youth sports academy. The procedure of the morphological characteristics and health related physical fitness were measured using standard tests such as body height (m), weight (kg), body mass index (kg.m²), waist circumference (cm), thigh circumference (cm), calf circumference (cm), hip circumference (cm), arm span (cm), leg length (cm) and sitting height (cm) was measured and also the physical fitness such as body composition, cardiovascular endurance, muscular strength and endurance, flexibility speed and agility. Data were analyzed using Mean ± SD and Analysis of Variance (ANOVA) and also Pearson product moment correlation was used to examine the relationship between morphological characteristics and health related fitness (HRF) of youth female soccer players. All significance level was set at $p < 0.05$. The results of the current study can show that youth goalkeepers reviled the higher score than outfield players in Ht, Wt, WC, HC, AS, LL and St.ht, the players with playing positions an ideal BMI was observed. Youth female players have a significance difference in all morphological characteristics between playing position. Youth players health related physical fitness between playing position revealed a significant difference observed only in 1.5 mile run and agility tests. While, there was no significant difference between playing position in BF%, Flexibility, Speed, Abdominal Strength and Endurance, and Arm Strength and Endurance. Morphological characteristics of female players have a significant relationship with health-related physical fitness (Bf%, Flexibility, speed and agility). While there was no significant relationship with 1.5-mile run, Abdominal Strength and Endurance, and Arm strength and endurance.*

Key word: Morphological characteristics, health related physical fitness, soccer, youth sport and playing position

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INTRODUCTION

Soccer or football is the most popular ball game around the world, with men, women and children competing on different levels (Reilly et al., 2000; Stolen et al., 2005; Grygorowicz et al., 2013). However, in a team sport such as Football, the requirement for frequent changes in the type of movements (e.g. walking, running, sprinting, jumping, tackling) speed (e.g. accelerations, decelerations), direction and technical tasks features an active profile that is intermittent in nature (Stolen et al., 2005). Women's soccer has received significant attention from sport academics the world (Pfister, 2015). Scientific interest in women's soccer has increased during the last few years (Daston et al.,2014).

Particularly, Morphological measures of body composition, both physiological and physical capabilities, including cardiorespiratory endurance, muscular strength, muscular endurance, and flexibility, are generally assessed through testing of soccer players (Stolen et al., 2005 and Canhadas et al., 2010). Anthropometry is the method of measuring the human body or the individual body parts, which involves the quantitative definition of the morphological traits, and insight into an objective image of the state of growth of the person tested. Morphological characteristics appear to be great importance for orientation and selection in the most of sport disciplines, given that they are present in the specification equation of almost every sport, morphological dimension occupy one of the major positions. For a large number of sports disciplines, the morphological structure that affects the sports efficiency the most is already known, although the coefficients of participation of individual morphological dimensions in the specification equation indubitably change due to the development of technique and tactics, and modern achievements in a particular sport. Soccer is a sports game played in the open field, and the training is usually based on the movement, expressed through endurance, which consists of a series of moderate activities, followed by alternating periods of high intensity, which leads to significant metabolic heat production (Masanovic, 2015). Role of morphological characteristics or body constitution in sport activities, on one side for specific kinesiological activity type, specific morphology type is necessary for above-average and top result achievement, and on the other side long-term training process, with regards of previous selection, genetically basis and social surroundings (Bala, 2000).

Morphological characteristics has been observed that may influence playing position within a team, with taller players tending to be found in goal and at centre-back, where being tall can be advantageous (Bangsbo, 1994; Reilly et al., 2000; Matkovic et al., 2003, Isabela et al., 2004; Bloomfield et al., 2004; Carvalho et al., 2004). Matkovic et al., (2003) found that in addition to being the tallest (182.9 ± 4.3 cm) and heaviest (80.1 ± 5.1kg), Croatian goalkeepers also had longer legs and arms (p<0.05). In study of European players, Bloomfield et al., (2003) concluded that variations in height and body mass between players in different leagues suggests that the styles of football may vary, with teams from different leagues preferring different types of players in certain positions. Players from the German Bundesliga were found to have the greatest height, body weight and body mass index (BMI) in comparison to top English, Italian and

Spanish league players (Bloomfield et al., 2003). Therefore, based on the aforementioned reasons this study aim to investigate morphological characteristics and health related physical fitness of female soccer player's Ethiopian youth sports academy.

MATERIAL AND METHODS

Cross-sectional study design was used. Participants of the study were male soccer players signed and having training in 2017/18 in the Ethiopia Youth Sport Academy of Ambo Federation International Football Association Goal Project, Tirunesh Dibaba Training Centre and Addis Ababa Youth Sports Academy. The reasons for choosing them are the trainees having regular training in their respective academy, they are living together and they are U15 and U17 female youth players in different playing position.

Morphological Variables

Participants" morphological variables; body height (Ht), weight (Wt), body mass index (BMI), waist circumference (WC), thigh circumference (TC), calf circumference (CC), hip circumference (HC), arm span (AS), leg length (LL) and sitting height (St..ht) were measured.

Physical Fitness Variables

Participants health related physical fitness test, Body Composition, (William Siri equation 1961) Cardiovascular Endurance (1.5 mile run cardiovascular endurance test), (Muscular Strength and Endurance (Sit up and push up test), Flexibility (Sit and reach test), Speed (35 meter sprint test), and Agility (Illinois agility)

Statistical Analysis

Statistical analysis was carried out using the „Statistical Packages for Social Sciences" software, version 20.0. Descriptive statistics are presented in means and standard deviations. Inferential statistics of Analysis of Variance (ANOVA) was used to determine significant differences among players at playing positions and also Pearson product moment correlation was used to examine the relationship between morphological characteristics and health related physical fitness (HRPF) of youth soccer players. All significance level was set at $p < 0.05$.

Characteristics of the subject female players in playing position
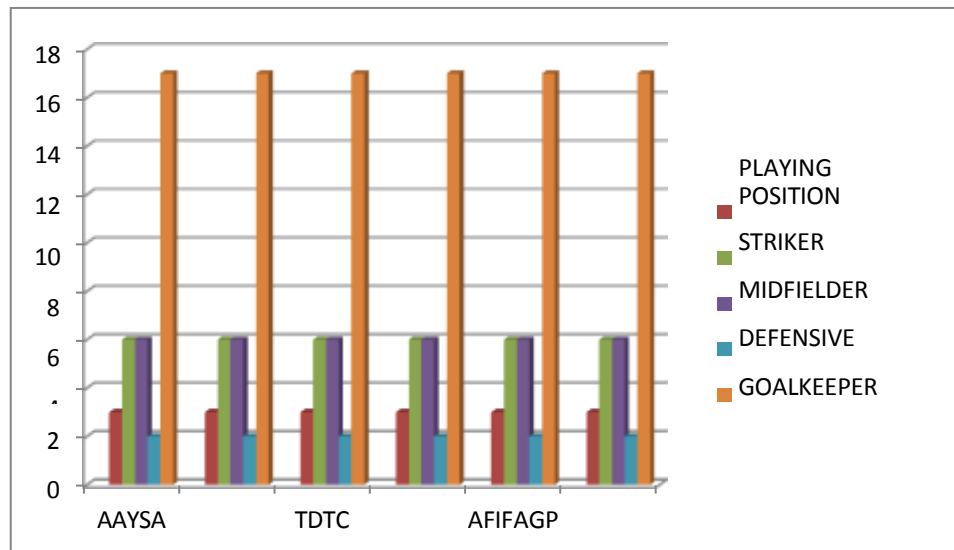
Y Axis: Percentage of players, X Axis : Different Football Academies
Fig. 1 shows the characteristics of the study participates in playing position.

As indicated the total number of the subject was 102 female players. Among this U-15 and U-17 the defensive and midfielder female players were recorded as the largest and equal number frequency 36(35.29%), followed by striker, 18(17.64) and goalkeeper 12(11.76).

Morphological characteristics of youth female players in playing position

Table. 1 presents the morphological characteristics of youth female football players" Ht, Wt, BMI, WC, TC, CC, HC, AS, LL and St.ht in playing position. Female goalkeeper players" were recorded the tallest Ht with a mean of 1.69±0.04m, followed by striker player 1.59±0.07m, defensive player 1.57±0.05m and midfielder player 1.57±0.05m. This can show that the players playing position have different stature status but while both defensive and midfielder players have equal height average in mater. The mean weights of female goalkeepers were recorded 56.67±3.89kg, followed by striker 51.94±6.42kg, defensive player 51.31±6.55kg, and midfielder player 50.97±6.56kg. This can show that the goalkeeper players have heavier Wt than the defensive, striker players and midfielder players in kg. The mean BMI of male defensive players were recorded 20.72 ± 2.30 kg/m^2, followed by striker player 20.67 ± 2.26kg/m^2, midfielder player 20.40 ± 1.44kg/m^2 and goalkeeper player 19.79 ± 0.93kg/m^2. This indicates that the players with playing positions have similar status in BMI. From the result, we can understand that the players have an ideal BMI in all academies as compared with the normal range of 18.5 to 24.9kg/m^2

health of BMI.

Female goalkeepers have recorded a mean of WC 76.58±4.50cm, followed by striker player 76.00±5.76cm, defensive player 74.74±6.40cm and midfielder player 74.26±5.15cm. This could be shown that the goalkeeper players have larger WC than the striker players, followed by defensive and midfielder players in playing position. The mean TC of female goalkeepers were recorded 51.25±2.87cm, followed by defensive players 50.07±3.68cm, striker player 50.03±3.63cm and midfielder player 49.85±2.57cm. The mean CC of the goalkeeper players was recorded 32.21±0.66cm, followed by defensive player 31.83±1.54cm, striker players 31.58±1.85cm and midfielder player 31.31±1.30cm. This could be shown that the goalkeeper players have slightly larger CC than the striker players, followed by defensive and midfielder players in playing position. The mean HC of the goalkeeper players were recorded 79.67±8.86cm, followed by striker players 77.58±6.07cm, defensive player 75.75±8.33cm and midfielder player 73.94±7.58cm. This can show that the players playing positions have different HC but strikers and defensive players have similar.

Female Goalkeepers have larger AS with a mean of 173.83±4.08cm, followed by striker player 160.22±7.06cm, defensive player 158.83±6.26cm and midfielder player 157.72±5.69cm. This can show that the goalkeepers have higher AS than striker, defensive and midfielder players. Female Goalkeepers LL have recorded a mean of 88.21±2.82cm, followed by defensive player 82.31±4.02cm, striker player 82.06±4.25cm and midfielder player 81.97±3.62cm. This can show that the goalkeeper players have longer LL than the defensive, striker and midfielder players in cm. The mean St.ht. of the female goalkeepers was recorded 85.92±1.68cm, followed by striker player 80.61±3.50cm, midfielder player 79.69±2.70cm and defensive player 79.68±2.80cm. This could be shown that the goalkeeper players have longer St.ht. than the defensive player, striker players and midfielder players in cm. The previous studies reported that morphological factors are essential for successful performance in sports (Can et al. 2004). Goalkeepers and defenders are often taller and heavier compared to midfielders and forwards (Dillern et al., 2012; Milanovic et al., 2012). Standing height values ranging between 161.3 cm and 171.9 cm have been recorded for elite female soccer players (Sedano et al., 2009; Bendiksen et al., 2013; Mara et al., 2017), while ranges between 159.1 cm and 164.3 cm have been reported for sub-elite female players

(Nikolaidis, 2014; Hasegawa & Kuzuhara, 2015). Similar average heights for elite female soccer players in Brazil, Croatia, and Denmark were reported by (Nakamura et al. 2016), (Sporis et al. 2007) and Krustrup et al. (2005) respectively. Milanovic et al. (2012) and Sporis et al. (2011) reported the greatest average standing height to be among goalkeepers, followed by defenders and noted that midfielders and forwards were among the shortest players.

Table 1 Morphological characteristics of female players' in playing position

Morph. Charact er.	Mean ± SD of Female in Playing Position				
	Striker	**Midfielder**	**Defensive**	**Goalkeeper**	**combined**
Ht (m)	1.59±0.07	1.57±0.05	1.57±0.05	1.69±0.04	1.59±0.06
Wt (kg)	51.94±6.42	50.97±6.56	51.31±6.55	56.67±3.89	51.93±6.44
BMI (kg/m^2)	20.67±2.26	20.40±1.44	20.72±2.30	19.79±0.93	20.49±1.90
WC (cm)	76.00±5.76	74.26±5.15	74.74±6.40	76.58±4.50	75.01±5.65
TC (cm)	50.03±3.63	49.85±2.57	50.07±3.68	51.25±2.87	50.12±3.21
CC(cm)	31.58±1.85	31.31±1.30	31.83±1.54	32.21±0.66	31.65±1.46
HC(cm)	77.58±6.07	73.94±7.58	75.75±8.33	79.67±8.86	75.90±7.89
AS (cm)	160.22±7.06	157.72±5.69	158.83±6.26	173.83±4.08	160.45±7.74
LL (cm)	82.06±4.25	81.97±3.62	82.31±4.02	88.21±2.82	82.84±4.24
St.ht. (cm)	80.61±3.50	79.69±2.70	79.68±2.80	85.92±1.68	80.58±3.40

Health related physical fitness of youth female players in playing position

Table 2 Presents female football players the mean and standard deviation of playing position health-related physical fitness measures - percentage of body fat (BF %), 1.5 mile run in min, sit and reach in cm (Flexibility), 1min sit-up repetitions (Abdominal strength & Endurance), 1min push-up repetitions (Arm strength & Endurance), 35 meter run in second (Speed) and Illinois agility in second (Agility).

The mean body fat the female striker players were recorded 16.61±3.36%, followed by goalkeeper players" 16.25±3.05%, midfield players"16.08±2.97%, and defensive players" 15.64±4.38%. This indicates that the female striker players showed slightly higher than the percentage of body fat goalkeeper player, followed by midfield and defensive players.

Female midfielder players recorded 1.5mile run a mean of 14.95±0.53min, followed by striker player 15.03±0.34min, defensive player 15.27±0.45min, and goalkeeper player 15.57±0.51min. From the result, we can understand the midfielder players faster than striker players followed by defensive players and goalkeeper players in a 1.5mile run.

The mean flexibility (sit and reach) of the female midfielder players were recorded as 13.78±4.55cm, followed by goalkeeper players 13.58±5.37cm, defensive players 12.98±5.08cm and striker players 12.56±4.37cm. This could be shown that the players in playing positions have different flexibility status the female midfielder players slightly flexible than goalkeeper players followed by defensive and striker players have a sit-reach test in cm.

Female goalkeeper players" had the mean of Abdominal strength & Endurance of 41.33±12.76rep/min, followed by striker players 41.11±12.78repe/min, defensive player 40.56±11.36repe/min and midfielder players" 39.97±9.24repe/min. From the result, we can understand the players with playing positions have different abdominal strength & Endurance. The goalkeeper players" scored abdominal strength & Endurance repetition better than striker players" followed by defensive players" and midfielder players" in a minute.

The mean arm strength & Endurance of the female goalkeeper players were recorded 18.00±10.30repe/min, followed by midfielder player 17.81±7.82repe/min, defensive player 17.42±10.09repe/min and striker player 17.28±8.01repe/min. This can show that the players in playing positions have a similar performance of arm strength & Endurance.

Female goalkeeper players were recorded speed (35meter run) a mean of 6.65±0.6sec, followed by striker player 16.70±0.36sec, defensive player 6.70±0.45sec and midfielder player 6.76±0.42sec. From the result, we can understand the goalkeeper players slightly faster than strikers and defensive players followed by midfielder players in speed.

Table 2. Health-related physical fitness of female players in playing position

HRPF	Mean ± SD of Female in Playing Position				
	Striker	**Midfielder**	**Defence**	**Goalkeeper**	**Combined**
BF%	16.61±3.36	16.08±2.97	15.64±4.38	16.25±3.05	16.04±3.57
1.5 mile run	15.03±0.34	14.95±0.53	15.27±0.45	15.57±0.51	15.15±0.51
Flexibility	12.56±4.37	13.78±4.55	12.98±5.08	13.58±5.37	13.26±4.76
Abd.Str.&Ed	41.11±12.78	39.97±9.24	40.56±11.36	41.33±12.76	40.54±10.94
Arm.Str.&Ed	17.28±8.01	17.81±7.82	17.42±10.09	18.00±10.30	17.60±8.88
Speed	6.70±0.36	6.76±0.42	6.70±0.45	6.65±0.61	6.72±0.44
Agility	17.81±0.45	17.72±0.42	18.13±0.34	18.68±0.33	17.99±0.49

The mean agility of female midfielder players was recorded 17.72±0.42sec, followed by striker player 17.81±0.45sec, defensive player 18.13±0.34sec and goalkeeper player

18.68±0.33sec. This indicates that the female midfielder players showed slightly faster than striker player, followed by defensive and goalkeeper players in Illinois agility.

ANOVA of players' morphological characteristics with playing positions

Table 3 presented that the differences in morphological characteristics of female players between Playing Positions. The result indicated that the obtained „F‟ ratio for groups‟ height was 17.841, which is greater than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence. Hence, the result indicated that there was a significant difference exists in morphological characteristics of height among female players between playing position at $p< 0.000$. The obtained „F‟ ratio for groups of weight was 2.7, which is equal with the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence. The result indicated that a significant difference exists in morphological characteristics of weight among female players between playing positions at $p< 0.052$. The obtained „F‟ ratio for groups of AS was 23.216, which is greater than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence. The result indicated that a significant difference exists in morphological characteristics of AS among female players in playing position at $p< 0.000$. The obtained „F‟ ratio for groups of LL is 9.088, which is greater than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence. The result indicated that a significant difference exists in morphological characteristics of LL among female players in playing positions at $p< 0.000$. The obtained „F‟ ratio for groups of St.ht. was 19.968, which is greater than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence. The result indicated that a significant difference exists in morphological characteristics of St.ht. among female players in playing positions at $p< 0.000$. On the other side, the obtained „F‟ ratio for groups of BMI was 0.795, which is less than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence. The result indicated that insignificance differences exist in morphological characteristics of BMI among female players in playing positions. The same insignificant difference was observed among female players in playing positions in morphological characteristics of WC, with the obtained „F‟ ratio for group was 0.726, which is less than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence, the obtained „F‟ ratio for groups of TC was 0.584, which is less than the

table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence, the obtained „F" ratio for groups of CC was 1.437, which is less than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence and also in HC with the obtained „F" ratio for groups was 1.982, which is less than the table value of 2.70 with df 3 and 98 required for significance at 0.05 level of confidence.

Table 3. ANOVA of Female Players Morphological Characteristics with Playing Positions

		Sum of Squares	df	Mean Square	F	Sig.
Ht	Between Groups	0.138	3	0.046	**17.841**	0.000
	Within Groups	0.252	98	0.003		
	Total	0.390	101			
Wt	Between Groups	316.297	3	105.432	**2.7**	0.052
	Within Groups	3878.222	98	39.574		
	Total	4194.520	101			
BMI	Between Groups	8.631	3	2.877	0.795	0.500
	Within Groups	354.754	98	3.620		
	Total	363.385	101			
WC	Between Groups	69.979	3	23.326	0.726	0.539
	Within Groups	3148.547	98	32.128		
	Total	3218.526	101			
TC	Between Groups	18.246	3	6.082	0.584	0.627
	Within Groups	1020.972	98	10.418		
	Total	1039.218	101			
CC	Between Groups	9.025	3	3.008	1.437	0.237
	Within Groups	205.229	98	2.094		
	Total	214.255	101			
HC	Between Groups	359.768	3	119.923	1.982	0.122
	Within Groups	5929.790	98	60.508		
	Total	6289.558	101			
AS	Between Groups	2512.255	3	837.418	**23.216**	0.000
	Within Groups	3535.000	98	36.071		
	Total	6047.255	101			
LL	Between Groups	394.296	3	131.432	**9.088**	0.000
	Within Groups	1417.285	98	14.462		
	Total	1811.581	101			
St.ht.	Between Groups	399.132	3	133.044	**16.968**	0.000
	Within Groups	768.410	98	7.841		
	Total	1167.542	101			

4   The result indicated that female players have shown that the significant differences between the morphological characteristics of Ht, Wt, AS, LL, and St.ht. between playing position. In line with the current finding, the F values indicated that differences ($p \leq 0.05$) existed among the positional groups in terms of means calculated for standing height and weight (Strauss, 2018). While their insignificance differences were observed in morphological characteristics of BMI, WC, TC, CC, and HC between playing position. In contrast with the current finding, the F values indicated that differences ($p \leq 0.05$) existed among the positional groups in terms of means calculated for BMI (Strauss, 2018).

ANOVA of youth players HRPF with playing position

Table 4 presented health-related physical fitness (HRPF) differences of female players between playing positions. The result indicated that the obtained „F" ratio of BF% for the group was 0.314, which is less than the table value of 2.7 with df 3 and 98 required for significance at 0.05 level of confidence. Hereafter, the result indicated that there was no significant differences exist in BF% among female players playing position. The same insignificant difference was observed in flexibility the obtained „F" ratio for group was 0.325, which is less than the table value of 2.7 with df 3 and 98 required for significance at 0.05 level of confidence, in abdominal strength and endurance the obtained „F" ratio for group was 0.068, which is less than the table value of 2.7 with df 3 and 98 required for significance at 0.05 level of confidence, in arm strength and endurance the obtained „F" ratio for group was 0.027, which is less than the table value of 2.7 with df 3 and 98 required for significance at 0.05 level of confidence and in speed the obtained „F" ratio for group was 0.223, which is less than the table value of 2.7 with df 3 and 98 required for significance at 0.05 level of confidence.

Whereas, a significant difference was observed among female players between playing positions were in 1.5mile run with the obtained „F" ratio for group was 6.514, which is greater than the table value of 2.7 with df 3 and 98 required for significance at 0.05 level of confidence. The result indicated that a significant difference existed in 1.5mile run among female players in playing position at $p< 0.000$. And also the same significant difference was obtained in agility with the obtained „F" ratio for group was 21.243, which is greater than the table value of 2.7 with df 3 and 98 required for significance at 0.05 level of confidence. The result indicated that a significant difference existed in agility among female players in sports academies at $p< 0.000$.

The result indicated that there was no significant differences exist in BF% among female players playing position. In opposite of the current finding, study conducted by, Sedano et al. (2009) grouped the players in their sample into a wider classification in terms of playing positions and reported a large variety of BF% values: goalkeepers (26.5%); full-backs (18.1%); center-backs (25.3%); midfielders (20.2%); wide midfielders (20.9%); and forwards (21.3%). Much lower BF% values than those noted in the study by Sedano et al. (2009) were reported by Sporis et al. (2007), with the lowest values measured in midfielders (12.6%) and slightly higher values reported for goalkeepers (13.7%), forwards (14.3%) and defenders (16.8%). Similar to the studies of Sporis et al. (2007) and Sedano et al. (2009), Todd et al. (2013) found that midfielders had the lowest BF% (24.0%). This was closely followed by defenders (24.2%) and forwards (24.3%), with the highest values measured among goalkeepers (26.3%) (Todd et al., 2013). Sporis et al. (2007) and Silvestre et al. (2006) explained that the low BF% value presented by midfielders could be due to the position-specific task of connecting two lines of play that midfielders must accomplish in a soccer match consisting of defence and attack. The higher BF% usually reported for goalkeepers was previously explained as being due to a lower aerobic demand specific to the position (Todd et al., 2013) and a decrease in energy expenditure during training and matches (Silvestre et al., 2006). According to Datson et al. (2014), it can be speculated that the positional differences demonstrated in recent studies are a result of increased training specificity for playing positions or that players with particular anthropometric characteristics are assigned to certain playing positions.

The finding of this study indicates that a significant difference in health-related physical fitness tests between the playing positions of female players was observed only in 1.5mile run and agility tests. In contrast with the current finding, the previous study indicated that there were no significant differences in the 1.5mile run were observed across outfield positions (Haugen, et al., 2014). The scores for the agility test showed that the results were not statistically significant (Vescovi et al., 2006). However, in agreement with the current finding, the result for speed shown that there was no statistically significant difference (Vescovi et al., 2006).

Table 4.   ANOVA of female players HRPF with playing position

ANOVA of Female Players HRPF with Playing Positions		Sum of Squares	df	Mean Square	F	Sig.
BF %	Between Groups	12.260	3	4.087	0.314	0.815
	Within Groups	1273.583	98	12.996		
	Total	1285.843	101			
1.5mile run	Between Groups	4.306	3	1.435	**6.514**	**0.000**
	Within Groups	21.595	98	0.220		
	Total	25.902	101			
Flexibility	Between Groups	22.539	3	7.513	0.325	0.808
	Within Groups	2268.326	98	23.146		
	Total	2290.865	101			
Abdominal Str. & End	Between Groups	25.038	3	8.346	0.068	0.977
	Within Groups	12072.306	98	123.187		
	Total	12097.343	101			
Arm Str. & End	Between Groups	6.520	3	2.173	0.027	0.994
	Within Groups	7964.000	98	81.265		
	Total	7970.520	101			
Speed	Between Groups	0.132	3	0.044	0.223	0.880
	Within Groups	19.257	98	0.197		
	Total	19.389	101			
Agility	Between Groups	9.655	3	3.218	**21.243**	**0.000**
	Within Groups	14.847	98	0.151		
	Total	24.501	101			

The relationship of youth female players in morphological characteristics and HRPF

As indicated in table 5 the relationship of morphological characteristics and health related physical fitness of female players weight has a significance positive correlation with BF% ($r = 0.338$, $r^2 = 0.114$, $P < 0.001$) at $P < 0.01$, BMI has a significance positive correlation with BF% ($r = 0.427$, $r^2 = 0.182$, $P < 0.000$) at $P < 0.01$ and also the same result was observed with flexibility ($r = 0.248$, $r^2 = 0.062$, $P < 0.012$) at $P < 0.05$. WC has a significance positive correlation with BF% ($r = 0.427$, $r^2 = 0.182$, $P < 0.000$) at $P < 0.01$, with flexibility ($r = 0.279$, $r^2 = 0.078$, $P < 0.005$) at $P < 0.01$ and also has a significance inverse correlation with agility ($r = -0.201$, $r^2 = 0.04$, $P < 0.042$) at $P < 0.05$. TC has a significance positive correlation with BF% ($r = 0.361$, $r^2 = 0.130$, $P < 0.000$) at $P < 0.01$ and also the same result was observed with flexibility ($r = 0.279$, $r^2 = 0.078$, $P < 0.004$) at $P < 0.01$. CC has a significance positive correlation with BF%

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(r = 0.320, r^2 = 0.102, P < 0.001) at P < 0.01. HC has a significance positive correlation with BF% (r = 0.472, r^2 = 0.223, P < 0.000) at P < 0.01. AS has a significance positive correlation with Agility (r = 0.231, r^2 = 0.053, P < 0.020) at P < 0.05. LL has a significance inverse correlation with speed (r = -0.269, r^2 = 0.072, P < 0.006) at P < 0.01.

While there was no significant correlation between the morphological characteristics of female players Ht and St.ht. with all health-related finesses. In the consistency of this result health-related fitness of female players Abdominal and Arm strength and endurance with all morphological characteristics.

Table 5. The relationship of female players in morphological characteristics and HRPF

		BF %	1.5mile run	Flexibility	Abd. Str. & End	Arm Str. & End	Speed	Agility
Ht	Pearson Correlation	0.061	0.123	-0.049	-0.026	0.020	-0.089	0.170
	Sig.	0.543	0.217	0.623	0.797	0.845	0.371	0.087
Wt	Pearson Correlation	**0.338****	-0.017	0.161	-0.026	0.086	-0.140	-0.044
	Sig.	0.001	0.865	0.105	0.793	0.391	0.159	0.663
BMI	Pearson Correlation	**0.407****	-0.094	**0.248***	-0.075	0.031	-0.087	-0.133
	Sig.	0.000	0.349	0.012	0.452	0.755	0.384	0.183
WC	Pearson Correlation	**0.427****	-0.168	**0.279****	-0.119	-0.079	-0.149	**-0.201***
	Sig.	0.000	0.092	0.005	0.234	0.429	0.135	0.042
TC	Pearson Correlation	**0.361****	-0.126	**0.279****	-0.152	-0.055	-0.104	-0.109
	Sig.	0.000	0.207	0.004	0.127	0.581	0.299	0.274
CC	Pearson Correlation	**0.320****	0.106	0.109	0.060	0.065	-0.175	0.021
	Sig.	0.001	0.287	0.274	0.548	0.518	0.079	0.833
HC	Pearson Correlation	**0.472****	0.189	-0.055	-0.076	-0.147	-0.056	-0.006
	Sig.	0.000	0.058	0.580	0.446	0.141	0.577	0.952
AS	Pearson Correlation	0.120	0.118	0.025	-0.021	0.010	-0.113	**0.231***
	Sig.	0.228	0.236	0.800	0.838	0.919	0.257	0.020
LL	Pearson Correlation	0.136	-0.013	0.081	-0.039	-0.034	**-0.269****	0.012
	Sig.	0.174	0.900	0.418	0.696	0.737	0.006	0.904
St.ht.	Pearson Correlation	0.081	0.148	-0.023	-0.004	-0.006	-0.161	0.120
	Sig.	0.421	0.137	0.819	0.967	0.952	0.107	0.228

**. Correlation is significant at the 0.01 level and * 0.05 level.

CONCLUSIONS

Based on the results of the current study the following points are concluded:

➢ Youth female goalkeepers reviled the higher score than outfield players in Ht, weight, WC, HC, AS, LL and St.ht., an ideal BMI was observed in all playing position, midfielders have smaller all morphological characteristics than the goalkeeper, striker and defensive players, and also in WC goalkeeper and striker players were scored higher than defenders and midfielder players.

➢ Youth female defender players have less BF% than goalkeeper, striker and midfielder players, midfielder and striker players were scored a better 1.5 mile run test than defender and goalkeeper players, midfielder and goalkeeper players were scored a better flexibility (sit and reach) than defender and striker players, midfielder players have the lowest abdominal strength and endurance than goalkeeper, defender and striker players. The goalkeeper players have a better arm strength and endurance than out filed players and also goalkeeper players have a better speed (35 meter run) than outfield players. The goalkeeper players have the lowest score in Illinois agility test.

➢ Youth players have a significance difference between the morphological characteristics of Ht, Wt, AS, LL, and Sh.t in playing position. While their insignificance differences were observed in morphological characteristics of BMI, WC, TC, CC, and HC between playing position.

➢ Youth players HRPF between playing position revealed a significant difference observed only in 1.5 mile run and agility tests. While, there was no significant difference between playing position in BF%, Flexibility, Abdominal Strength and Endurance, Arm Strength and Endurance and speed.

➢ Morphological characteristics of female players have a significant relationship with Bf%, Flexibility, speed and agility. While there was no significant relationship with 1.5 mile run, Abdominal Strength and Endurance, and Arm strength and endurance.

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