Do our University's Male Handball Players Show Similar Physical and Physiological Properties to the Distinguished World Sportsman?

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SUMMARY

What can be done to reach the Olympic records and high efficiency level? Can our players be Olympic champions? The aim of this study is to reveal the properties of proper persons, suitable to the branch of sports.This study is a body result of 16 male players, take active roles in the hand ball team of the university. Variables are;age,height, weight,measurements of body fat percentages, 30m.sprint speed measurement, heart beat measurement during rest, systolic-diastolic blood pressure,vital capacity, maximum $V0_2$ (Cooper test). Measurements; taken from 0,5 kg intervaled balance with shorts on and wihtout shoes.ın this study.age average, as 21.81 ∓ 2.34; height average, as 176.12 ∓ 6.21 cm; weight average,as.74.81 ∓ 8.85 kg. ; Qindex average, as 420.42∓47.28 weight kg/hwight cm.1000; body fat percentage average, as 10.10 ∓ 2.58mm; 30m sprint (sn)average, as 4.55 ∓ 0.15 m/sn; Vertical jump average as 58.75∓6.43 cm; pulse average, as 82.00+5.25(pulse/minute); systolic tension average, as 121.87∓11.67mm/hg; diastolic tension average, as 76.56∓mm/hg; Vital capacity average, as 4.74 ∓ 0.45ml; Maximum $V0_2$, as 44.32 ∓ 5.02(ml/kg.min) were determined. Correlation and regression statistical methods were used to evaluate the data

Key Words: *Handball, Sportsman, Physical, Physiological Properties.*

Üniversitemiz Erkek Hentbol Oyuncularının Fiziksel ve Fizyolojik Özellikleri Dünya Elit Sporcularının Özellikleri ile Benzerlik Göstermekte midir?

ÖZET

Olimpiyat rekorlarını yakalama ve yüksek verim düzeyine ulaşmak için, neler yapılabilir? Sporcularımız olimpiyat şampiyonu olabilir mi? Yapacağımız iş, spor dalına en uygun kişilerin özelliklerini ortaya çıkarmaktır. Çalışmaya Üniversite Hentbol Takımı'nda aktif olarak yer alan 16 erkek oyuncunun bedensel sonuçlarıdır. Değişkenler: Yaş, Boy, Ağırlık, Vücut Yağ Yüzdesinin Ölçümü, 30 mt. Sprint Hızı Ölçümü, İstirahatte Kalp Atım Sayısının Ölçülmesi, Sistolik-Diyastolik Kan Basıncı, Vital Kapasite, Max. VO_2 (Cooper Testi). Ölçümler: şortlu--ayakkabısız olarak 0.5 kg aralıklı baskülde alındı. Bu çalışmada yaş ortalaması 21.81±2.34, Boy ortalaması 176.12±6.21 cm, Ağırlık ortalaması 74.81±8.85 kğ, Qindex ortalaması 420.42 ±47.28 ağırlık kg /boy cmX1000, Vücut Yağ Yüzdesi Ortalaması 10.10±2.58 mm, 30 m. Sprint (sn) ortalaması 4.55±0.15 m./sn, Dikey sıçrama ortalaması 58.75±6.43 cm, Nabız ortalaması 82.00±5.25 (nabız/dakika), Sistolik Tansiyon ortalaması 121.87±11.67 mm/hg, Diyastolik Tansiyon Ortalaması 76.56±51 mm/hg, Vital kapasite ortalaması 4.74± 0.45 ml, Max VO2 44.32±5.02 (ml/kg.dk) ortaya konuldu. Korelasyon ve regresyon istatistik yöntemleri kullanıldı.

Anahtar Kelimeler: *Hentbol, Sporcu, Fiziksel, Fizyolojik Özellikler*

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INTRODUCTION

For our country to be successful in sports, to distinguish the representing sportsman much earlier is indisputably required. As in all sports, technic, tactic, capacity as well as condition of a team are the basic elments to be succesful in handball. Main discussion in this manner seems to continue in terminological concepts. If it is so, the basic terminological concepts is to point out the vertical jump and 30 m sprint as dependant variable. Physical variables as age, height, weight, taking role in handball sport branch were taken into consideration. As selection of a proper person for handball is performed in early ages, physyologic properties with physical profile should be learned. Variables to determine physical profile were observed. The obseved variables comprise of respiration parameters, blood pressures, aerobic and anaerobic capacity. Aerobic exercise shortly means a work with oxygene. It is realized with working of large muscle groups in the presence of abundant oxygene, at 60% - 80% level of maximum pulse for at least 12 minutes or long period . The indicated period, 12 minutes,is very essential, here. Because, at the end of this period, the enzyms to burn the fat of body are produced then.In addıtion,aerobic exercies cause to increase the intake amount of oxygene into body,to provide heart to consume much oxygene and increase condition level of heart as well as lungs(1) Anaerobic means lack of oxygene muscles work with needed to oxygene.This case also activates the sugar consuming enzymes.In this activation,more energy is consumed than the body may produce with methabolizing oxygene..The purpose is to reveal physical and physiological properties of our university's handball sportsmen, compare them with the distinguished world sportsmen.Handball is a branch of a sport which continuously spreads and gets much interest.Sportive technics is taught with conscious; resistance, rapidity, talent, mobility, and jumping like motoric properties should be starled to teach at the childhood and adolescence period, then evaluated gradually. Handball is a competitional game of two teams in a friendship framework.A team has 12 players. There are only 7 players on the field for each team.The rest players are substitutes.The players may be taken to.the game at any time and stay in their changing fields.

MATERIAL and METHOD

This study is comprised of 16 male players who take role actively in the Dicle University's handball team.The considered variables within the study are; age, height, weight,9 index, (mm), body fat percentage,30meter sprint (sn) vertical jump(m), pulse during rest, cystolic and diastolic blood pressure,vital capacity(ml), maximum $V0_2$(ml/kg.minute), 12 minute running test (cooper). The weight is measured without shoes and light weight clothes on,as well as taken with the balance of having 0.5 kg sensivity.The height variable was measured with Martin type anthropometer instrument.The height measurements were done without shoes,on a smooth place,as the players' back can be received smoothly from head mastoid extentions,and brought to Frankfort plane (2). Body fat percentage variable is meassured by using lange skinfold caliper instrument, from 6 different standart regions subcutaneous thickness sites.A 30. meter sprint variable is taken for being consistent with the definition, and having the sportsman run twice, and taking their best degrees into consideration.Vertical jumping test variable is taken with the joining feet and with the upright body , as a result of turning the body to the side and an individual arm to up postion,to touch the middle finger to make a mark.Later, the sportsman,with two legs,is jumped vertically,without taking any steps. After remarking the touched point, the differences of two levels were measured as centimeter. The best movement was accepted after two repititions.

The pulses of sportsman were taken during rest.Systolic and diastolic blood pressure are measured by sphingomanometer working with mercury,after the sporstsman's resting for 5 minutes.Vital capacity measurement is taken with "Spiro Analyser ST 300 Fukuda Sangyo instrument. Measurement of Maximum $V0_2$

capacity was performed with the measuring the taken distance of a sportsman in 12 minutes.As statistical evaluations,spearman r correlation coefficient,partial correlation coefficient,multi varied regression analysis method and determinative statics were used.Grouping of 12 variables were shown with graphics by gradual grouping analysis method. Statistica package programme was used as statistical package programme (3).

RESULTS

In this study, physically measured (age,height,weight,Q index and body fat %) variables and physyologically measured (30 m sprint,vertical jumping,pulse,systol diastol,vital capcity and 12 minute (cooper), Maximum $V0_2$) variables were measured.These measurements were compared with the dıstinguished national Handball team players' values. Correlations were found with the values of the Dicle University's handball team players.The 30 m sprint variable was taken as dependant variable and a multi regression equation was found with the other variables. Descriptive statistics are presented on Table 1 with average, median, and standart deviation of variables, 95% of confidence interval of variables.

Table 1. Basic descriptive statistics

	N	Average	Confidence interval -95.0%	+95.0%	Median	std deviation
age	16	21.81	20.56	23.06	22.00	2.34
height	16	176.12	172.81	179.43	177.50	6.21
weight	16	74.81	70.09	79.53	72.00	8.85
Q index	16	420.42	395.23	445.62	418.61	47.28
Body lipid %	16	10.10	8.72	11.47	10.04	2.58
30 meter sprint	16	4.55	4.47	4.64	4.500	.154
Vertical jump	16	58.75	55.32	62.17	60.00	6.43
pulse	16	82.00	79.20	84.79	84.00	5.25
Systolic pressure	16	121.87	115.65	128.09	120.00	11.67
Diastolic pressure	16	76.56	73.09	80.03	80.00	6.51
Vital capacity	16	4.74	4.50	4.98	4.80	.452
Max VO2	16	44.32	41.64	47.00	45.17	5.02

Table 2 shows demographical values of the Dicle University Handball team and the distinguished Handball players. Age variable average of handball team of Dicle University is 21.81∓ 2.34 but that of the distinguished level handball players is 24.92 ∓ 3.65, which was found significantly different($p<0.005$).As ıt has not been found any difference in Q index variables, height, weight, and body lipid percentage variable averages were found to have essential differences ($p<0.001$).

Table 2. Physical, physiological and Conditional Average values of the Dicle University Handball team and the distinguished Handball players.

variables	Dicle university handball team player n=16	Distinguished handball players (n=26)	P
age	21.81 ± 2.34	24.92±3.65	<0.005
height	176.12±6.21	183 ± 4.04	<0.001
weight	74.81 ±8.85	87.09 ± 9.06	<0.001
Q index	420.42 ± 47.28	442.4 ± 35.55	>0.05
Body fat %	10.10 ± 2.58	19.11 ±3.99	<0.001
30 meter sprint	4.55 ± 0.15	4.14 ± 0,07	<0.001
Vertical jump	58,75 ±6,43	56,38 ± 8,01	>0.05
Vital capacity	4.74 ± 0,45	5,60 ±0,70	<0.001
12 min (cooper) Max VO2	44.32 ± 5,02	57,0 ± 4,89	<0.001

Table 2 presents physiological and conditional Average values of the Dicle university handball players and of the distinguished level handball players. 30m sprint variable average of Dicle university handball team seemed to be 4.55 ∓ 0.15 which was found to be significantly different from those of the distinguished handball players.There was no difference in the data of vertical jump values,but vital capacity, and 12 minute (cooper test) Maximum $V0_2$ variable averages seem to have important changes($p<0.001$.).

Table 3 shows Spearman Rank correlation coefficient and importance control between the variables. There is a sr=0.69 relationship between the first line ,age variable and 30m sprint variable,which was found statistically significant($p<0.002$).In addition there is a negative cor relation between age veriable and max.$V0_2$ variable This relation is sr=-0.54 and statistically significant($p<0.002$).In the second line, the relation between height and weight variable was found to be quite important as sr=0.75.($p<0.001$).Besides,the relation between Q index and height variables was found to be significant.as sr=0.65 ($p<0.001$).In the third line, the relation between weight variable and Q index variable seem to be quite significant,as Sr= 0.94 , ($p<0.000$). In the fourth line, there seems to have a negative correlation between 30 m sprint and vertical jump variables. This relation is sr= -0.50 and seems quite essential ($p < 0.05$). At last , Systol variable and diastol variable of the handball players seem to exhibit an important difference and relations (Sr = 0.68), ($p<0.003$). The variables which have unimportant correlations were not implied here. When 30 m Sprint Variable is taken as independently , and age as well as vertical jump variables taken as independent variables, the multi regression equation below written is received. 30 m sprint (Y) = 4.49 + 0.032*age – 0.01* vertical jump + e

Table 3. Spearman rank correlation coefficient and significant control between the variables

variables	weight	Q Index	30 m Sprint	Vertical jump	Diastolic pressure	Max VO_2
Age			0.69			-0.54
Height	0.75	0.61				
weight		0.94				
30 meter sprint				-0.50		-0.65
Vertical jump			-0.50			0.55
Systolic pressure					0.68	

The coefficient values taken in the equation are as $b_0 = 4.49, b_1 = 0.03, b_2 = -0.01$ and have been found statistically significant($p<0.05$).

Figure 1 shows the grafics of 30 m sprint = $b_0 + b_1$ age + b_2 Vertical jumps of Dicle university man handball team and correlation of 30 m sprint variable and age variable with vertical jump. Figure 2 shows graphic of the vertical jump values of Dicle University man Handball team. Figure 3 shows the variables groupings of Gradual grouping analysis method ın weighed group average of Dicle University handball team.

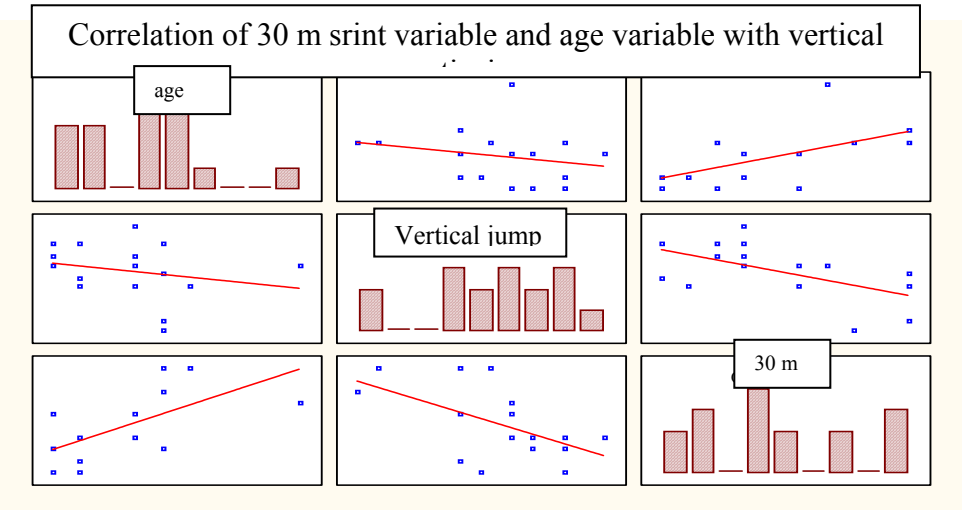

Figure 1. The grafics of 30 m sprint = $b_0 + b_1$ age + b_2 Vertical jumps

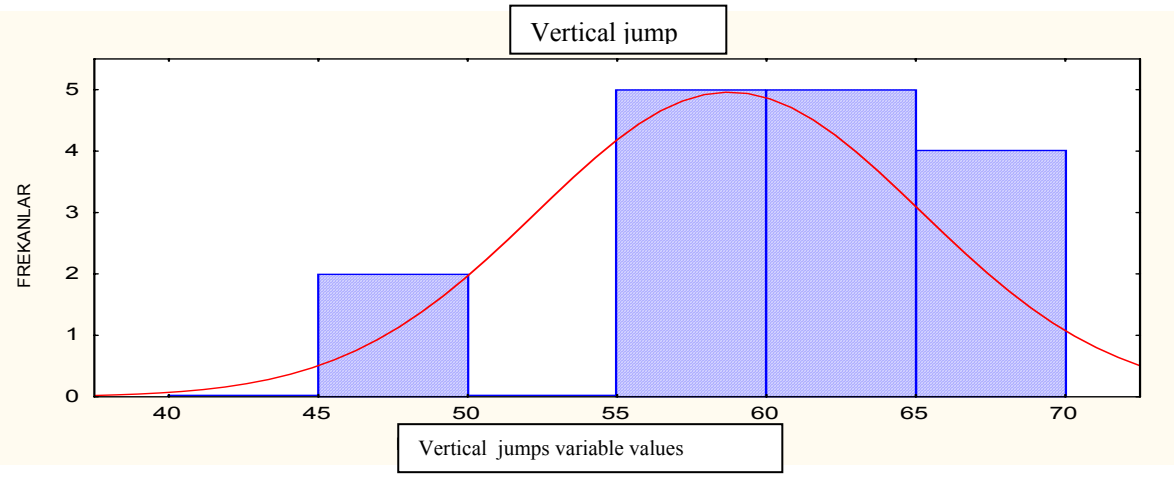

Figure 2. Graphic of the vertical jump values of Dicle University man Handball team.

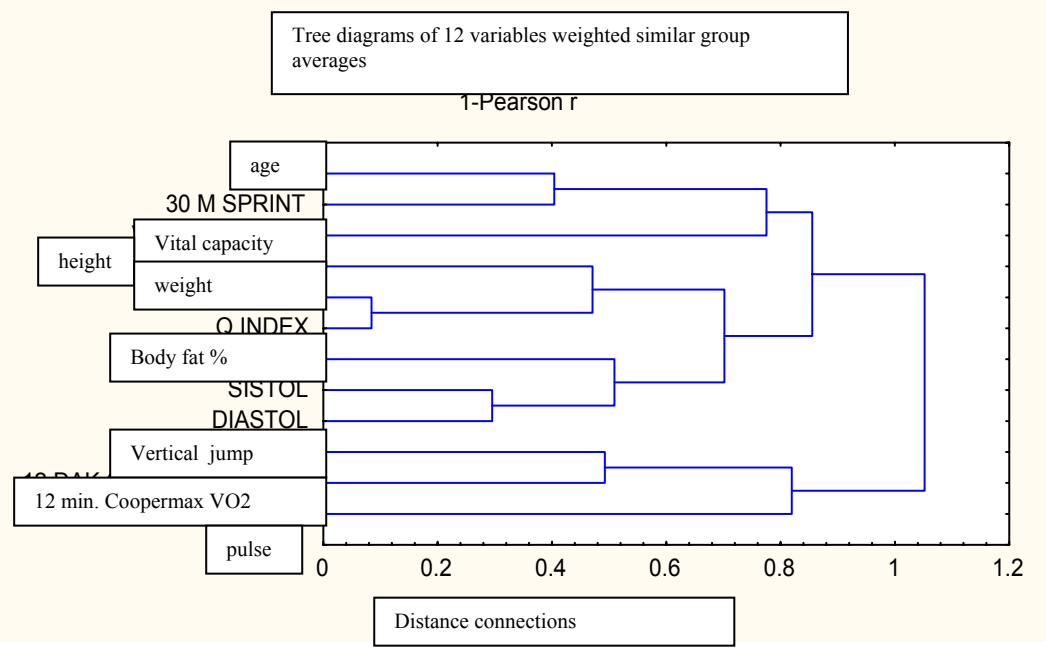

Figure 3. The variables groupings of Gradual grouping analysis method ın weighed group average of Dicle University handball team.

According to the graphic results, the variables seem to accumulate in 4 groups.The first group is age and 30m sprint variable group.To these variables, vital capacity is attached.The second group is accumulated among height variable, weight and Q index variables.

The third group is accumulated among body fat percentage variables systole and diastol variables.The fourth group is accumulated in vertical jump variable and maximum $V0_2$ pulse variables.When age and 30 m sprint are observed,there seem to have an important relation between them with sr=0.75 ($p<0.001$). In the same group, an impartant relation as sr=0.94, was found between Q index and Weight variable ($p<0.000$).There is an important relation between systol variable and diastol variable as sr=0.68($p<0.003$).These two variables join with the body fat percentage variable in this group.Vertical jump variable, taking place in the last group seems to show a positive relation as Sr=0.55, with maximimum $V0_2$ variable ($p<0.002$)

DISCUSSION

With this study, some physical, physiological and conditional situations of totally 16 players playing in Man Handball team of Dicle University were determined, and the values were compared with 26 sportsman being in national team players level.Age average of the Dıcle University team was found as 21.81 ∓ 2.34. Average, standart Deviation and median values of 12 variables, which have been the main topics of the study,are presented in Table 1 with 95% confidence interval. According to Sevim and et al., the age average was reported as 24.51. In addition, the age average of Denmark Handball National Team was given as 24,4; of Poland Handball National Team, as 24.64;of Finland Handball National team, as 25.1 (3).In another study carried out by Oğuz et al, the age average of Turkish national Team's level was given as 24.92 ∓ $3.65_{(4)}$ This is found as an important difference from the age average of Dicle University handball Team ($p<0.005$). Tamer reports the beginning age for handball as 8-10 and and performance period as 20-32 (5) The height average of the national team players was given as 183.0 ∓ 4.04, in Table2. These values are considerably higher than those of Dicle university Handball team values ($p<0.001$). As height variable is taken ınto consideration, the order of heights from to

lowest to highest are as, Dicle University with 176.12 ∓ 6.21 cm; the age average of Finland Natıonal Team players with 182.6 cm; Turkish National Team players with 183 ∓ 4.04 cm;Poland National Team players with 189.28 cm and Denmark National Team Players with 190.0 cm (4). The height of Turkish National Team players are very close to that of Finland National Team Players' values are lower than those of Poland Team Values which possess quite more international successes, (3), (4) To these results, Dicle University Handball Team players seem to carry out the lowest height average of the teams.Being tall is a big advantageous for success in handball. It can be said that not owning the desirable success inter universities seem to be resulted from the low height of the players, included in the research when the selection of the players is conducted, it is important to consider to be keen on choosing taller players.The weight average of the Dicle University Handball player's was found to be as 74.81 ∓ 8.85 kg and compared with those of the distinquished players values (87.09 ∓ 9.06 kg).The distinguished players are much heavier and this is an impartant finding too.($p<0.001$).The lightest team was found to be the Dicle University team,then the order goes as Turkish Handball Team,Finland Handball Team with 83.2 kg,Poland Handball Team with 88.7 kg(3-4).with being the lightest and owning the lowest height, the Dicle University Handball Team implies not to match international standarts and our, representing South East Anatolia Region seems to remain under the international standarts.It shows that the sportsman to represent the region seems not to hold the necessary requirments for the sports branch.It is observed that socio economical levels of the sportsman are not adequate and they seem not to have balanced nutritients,and those not to own adequate physical developments. In addition to being tall, being built as heavy is also a good advantage for handball.Q index value averages of Dicle University Handball Team with 420.42 ∓ 47.27 value seem not to be different from those of Turkish distinguished Handball Team average which, is 442.4 ∓ 35.55 ($p>0.0$). but the values seem to be quite diferent from Finland's team's value with 454.65; Poland's team's value with 459.67 and Denmark's team's value with 468.84 ($p<0.001$). The high values of Q index implies resistance and strength, but meanwhile the body should not contain fat.According to these data Dicle University Handball Team takes the last place of showing good team performance.As shown in Table 2 the body fat percentage average is 10.10 ∓ 2.58 and seems quite different from the Turkish distinguished Hanball Team's values which is 819.11 ∓ 3.99($p<0.001$).In the study of Oğuz and Sevim,the value of Denmark Hanball Team's body lipid percentage is 13.2%(3),in the study of Tamer,the body fat percentage of Middle East Technical University players were indicated as 12.5%(6). The lowest body lipid values seem to be with the Dicle university players. As to physical measurement values, It seems that the Dicle University Team's values represent the lowest of all. With these low values,to expect high succesful results is not logical.This should be considered during the student's admissions to the sport department of the school.It is surely not logical to yield higher expectations.if the selection of the admissions is not done with a great care in the required manner.

The average value of 30 m sprint which is of conditional property is 4.55 ∓ 0.15 and considerably different from the National Team disguished handball average values, 4.14 ∓ 0.07 ($p<0.001$). Oğuz and et al explains the 30 m sprint average values of Finland team as 4.23 sn. They reported the average values of Romania Handball Team as 4.41 sn Bulgarian Handball Team's average values were measured as 4.2 sn.As in vertical jump values, Turkish distinguished handball Team average is 56.38 ∓ 8.01 cm,then,orderly; the average values of Dicle University Team values as 58.75 ∓ 6.43 cm the average vertical jump values of Finland Handball team values as 58.8 cm,those of Germany as 60.4 cm,those of Poland as 61.2 cm comes (3) Although the Dicle University Players are comparatively shorter, their body fat percentage were observed. These results seem to have a resemblance to the other team's values as in

vertical jump.Dinçer and et al explains that vital capacity values of sportman are much higher than those of not being sportsman/7). The average vital capacity of Dicle University is 4.74 ∓ 0.45 and found considerably far away from the average of the national distinguished team values which is 5.60 ∓ 0.70 ($p<0.001$) Having the low vital capacity values implies that the sport trainings of the Dicle University are not adequate. 12 minute (Cooper Test) max VO2 variable average of Dicle University Team players is 44.32 ∓ 5.02 ml.kg/min and is quite different from that of the national distinguished team values being 57.07 ∓ 4.89 ml.kg/min($p<0.001$). Aslan and Gönül have found important differences of max $V0_2$ capacity values between the persons doing and not doing sports.They indicate max.$V0_2$ consumption averages of sports doing student values as 46.62 ∓ 4.13 ml.kg/min (8) Öz and et al, based on Cooper Test which is a strenght test of height, weight as well as age variables, reveal the run distance variable, based on height, body weight and age variable, as 8.3 % ratio.They explain that unexplained 91.16 % part to be resulted from various sport tests and technics or related to nutrition as well as similar conditions (9) According to the correlation coefficients shown in Table 4,It seems to have relations with age, 30 m sprint variable, height variable.These variables tend to show an accumulation as factor with 0.94 coefficient found between weight and Q index variables.They are observed as physical measurement groups.On the other side, cystol and diastol variables, which are physological variables, show correlation ceefficient value as Sr=0.68.There is a negative relation between Max $V0_2$ and 30m sprint as Sr=-0.65 value.These group variables are combined with vertical jump variable.In addition, When 30m sprint is considered,as independant variables, the equation; derived by age and vertical jump variables tend to reveal important coefficients. This means that the physologic measurements also exhibit important values. As there is a unit increase in age variable, there is 0.032 value increase in 30 m sprint variable. This increase is quite important. In addition, when there is a unit increase in vertical jump variable, there is 0.032 value decrease in 30 m sprint variable (Figure 1). 12 variables are accumulated in 4 basic groupings, as seen in Figure 3. The groupings are orderly as below. As group 1; age variable, 30 m sprint and vital capacity variable groups. As group 2; height variable, weight variable and Q index variable combined with physical measurement grpups. As group 3; it is a physiological variable group, which has basic properties of a sportsman, comprising of body fat percentage variable and cystol – diastol variables. As group 4; It is a group, comprising of vertical jump variable, 12 minute Max. VO_2 Oxygene capacity variable and pulse like physiological variables. This group can also be called as muscle – oxygene – condition group. As a result, sport is a job group which requires continuation, planning and order

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