Table no.1 – Results of the questionnaire of creative attitudes (adapted by M. Roco, 2001) in physical education students

Identification notation			The 16 creative attitudes																Total points	Percentage %
No.	Initial	ge	En	Cn	On	Ai	I	N	Sc	Vm	Of	F	R	P	Di	Vs	Vp	L		
1	B. M.	20	6	6	6	8	6	6	6	9	9	11	6	12	9	8	5	14	127	39,07
2	C.V.	19	7	9	7	9	9	9	10	8	7	15	7	9	7	8	7	18	146	44,92
3	M.A	20	8	8	11	14	9	12	10	9	9	8	11	8	8	7	11	14	157	48,30
4	A.A.	20	10	8	8	13	12	8	10	10	9	13	10	9	10	10	8	13	161	49,53
5	N.M	21	12	9	8	12	9	10	8	10	11	12	9	11	8	10	8	20	167	51,38
6	R.V.	20	13	8	7	12	11	9	10	8	12	10	10	10	10	11	9	17	167	51,38
7	C.A.	20	9	10	12	13	12	12	13	11	6	12	10	12	12	6	9	12	171	52,61
8	R.R	20	11	9	12	11	10	10	10	12	13	10	10	10	12	8	10	14	172	52,92
9	M.I.	20	11	11	11	12	9	12	10	9	9	13	11	11	9	11	12	17	178	54,76
10	M.O	20	11	11	11	10	10	9	9	12	13	12	9	11	11	9	10	20	178	54,76
11	ZC	21	11	10	10	12	13	11	12	9	12	11	12	12	10	10	10	15	180	55,38
12	U.I.	20	12	11	12	12	10	11	11	9	14	11	9	11	8	10	9	20	180	55,38
13	R.A.	21	13	7	8	13	11	12	7	10	11	13	11	9	8	13	13	21	180	55,38
14	I.S.	20	9	8	14	14	10	11	13	11	10	10	13	12	11	9	12	14	181	55,69
15	C.A.	20	11	9	11	13	10	11	14	12	11	14	11	11	11	13	8	11	181	55,69
16	E.A	20	11	8	11	12	10	12	10	10	13	12	11	10	12	10	13	16	181	55,69
17	P.B.	20	10	12	8	13	15	15	15	11	11	14	9	9	9	5	14	15	185	56,92
18	P.D.	21	11	11	9	15	14	11	9	8	15	15	13	8	9	13	11	15	189	58,16
19	P.I.	20	11	14	11	13	10	12	13	8	11	14	12	11	9	10	11	22	192	59,07
20	B.V.	21	13	13	8	14	11	11	14	12	12	15	14	10	8	7	11	21	194	59,69
Arithmetic mean			10,5	9,6	9,75	2,25	9,55	10,7	10,7	9,9	10,9	12,2	10,4	10,3	9,55	9,4	0,05	16,4		
Standard deviation			1,91	2,04	2,15	1,71	1,99	1,89	2,41	1,45	2,27	1,94	1,96	1,30	1,54	2,23	2,24	3,28		
Maximum value			13	14	14	15	15	15	15	12	15	15	14	12	12	13	14	22		
Minimum value			6	6	6	8	6	6	6	8	6	8	6	8	7	5	5	11		

Legend: Energy (En), Concentration (Cn), Orientation toward novelty (On), Argumentation of ideas (Ai), Independence (I), Nonconformity (N), Self-confidence (Sc), Moral values (Vm), Orientation toward the distant future (Of), Finalization (F), Risk (R), Preference and attraction to difficult problems (P), Diversity of interests (Di), Spiritual values (Vs), Practical Values (Vp), Lie scale (L).

THE INVESTIGATION SOMATOTYPE PROFILES OF UNIVERSITY STUDENTS

Nazmi Saritaş[1] Irfan Özkarafaki[2] Osman Pepe[1] Serdar Büyükipekçi[1] Bekir Çoksevim[1]
[1]Physical Education and Sports College of Erciyes University/ Kayseri, TURKEY
[2]Kızılırmak *Anatolian* High *School* Physical Education Teacher/ Kırşehir, TURKEY
Email: nsaritas@erciyes.edu.tr / 08.03.2010 / 19.03.2010

Abstract

Objective. In this study, it was aimed to investigate somatotypes of Erciyes University students which were studying in different colleges and faculties.

Method. At this study, 405 men and 282 women students of Erciyes University, aged between 20-25 were joined voluntarily. Volunteers'' height, body weight, thickness of skin which are necessary for determining somatotypes, the environment and diameter parameters were measured. After all data was collected, all values were compared according to gender and their higher education. One Way ANOVA test was performed for determining the differences between students. Heath-Carter method was performed for determining somatotype profiles of Study grouped. Significance level was accepted as 0.05.

Result. In the study, while, body mass index parameter wasn't found significant between male students, it was found significant between female students according to faculties ($p<0.01$). Endomorph, mesomorph and ectomorph values were found significant between female students of Physical Education and Sport School and the other faculties

($p<0.05$). While endomorph and mesomorph parameters were found significant between male students of Physical Education and Sport School and the other faculties ($p<0.05$), meaningful difference wasn't found echtomophy parameter ($p>0.05$)

Conclusion. Because of students which were studying at Physical Education and Sport School were being more active than other faculties according to their curriculum, continuing sportive activities and sporting facilities had a positive effect on consisting of somatotype of University Students were observed.

Key words: Anthropometry, Somatotype, Body Mass Index, University students.

Introduction

The somatotype is a description composed by the individual's physique, and it is defined by a set of components. There are three main somatotypes: endomorph; characterized by a rounded body shape mesomorph; characterized by muscular and stocky physique of medium height, ectomorph; characterized by a tall, thin body (J.E.L Carter, T.A. Ackland, D.A. Kerr 2005, C.A. Fett, W.R. Fett, S.R. Oyama, 2006., S.P. Singh, 2007)

Individuals usually have elements of each type, and their composite somatotype is described in a three-figure rating system. In one system (the Heath-Carter somatotype system) the ratings are based on a number of factors, such as Skinfold measurements, age, height, and weight; (D.M. Hopper, 1997., İ. Gahhar and S.L. Malik, 2002) in another system the classification of body types into three basic types: endomorphy (roundness), mesomorphy (muscularity), and ectomorphy (linearity). Sheldon based his classification on thousands of photographs of naked individuals taken from three different perspectives. From these photographs, measurements were taken and each individual ascribed a three-number classification. Each number has a value from one to seven designating the amount each component contributes to the individual's physique: one represents the least contribution and seven the most.

The first number represents the amount of endomorphy, the second number the amount of mesomorphy, and the third number the amount of ectomorphy. Thus, 7–1–1, represents extreme endomorphy; 1–7–1, extreme mesomorphy; and 1–1–7, extreme ectomorphy (S.P. Singh, 2007).

At this study about university students, is important for evaluation effects of students' life styles on their body types and suggesting exercise programmers according to them. Also, this study is very important because of over weight and obesity's being one of the most important healthy problems of the world and for informing about somototypes of our youth of society

Method

This study was done on 20-25 aged healty 405 male and 282 female students which were studying at the different departments of Erciyes University and, also lived in female and male dormitories of General Directorate of Credit and Dormitories Agency. Informed consent was obtained from all subjects before the study. The study protocol and the procedures were approved by the local ethical committee. The study was conducted in accordance with the Declaration of Helsinki or local laws depending on whichever afforded greater protection to the subjects.

Codes of Faculty or College

Physical Education and Sports College (F1)**,** Faculty of Arts And Sciences (F2), Faculty of Engineering (F3), The Faculty of Economics and Administrative Sciences (F4)**,** The Faculty of Education (F5)**,** Faculty of Medicine (F6) as given.

Somatoytpe Measurement and Calculation

The anthropometrical measurements were taken by the same researcher. Morphological conformation was determined by utilizing the Heath-Carter Anthropometric Somatotype Rating Method. The following 10 body measurements were obtained for each subject employing the method as described in (J.E.L. Carter and B.H. Heath., 1990, J.E.L. Carter, 2002). 1. Height (stature), 2. Body weight, 3. Bicondylar humerus, 4. Bicondylar femur, 5. Upper arm circumference, 6. Calf circumference, 7. Skinfold at triceps, 8. Skinfold at Subscapula, 9. Skinfold at supraspinale and 10. Skinfold at calf. Stature was measured to the nearest 1 mm with an anthropometry, body weight with minimal clothing was recorded to the nearest 0.05 kg employing a weighing scale, and skinfolds were obtained using a Holtain caliper with a constant pressure of 10 g/mm. Outlier subjects in each group with a measurement value greater than 3 standard deviations (SD) from the mean were deleted. After the mean values and Standard deviations were obtained for the final data set, the somatotype components of the individual subjects were calculated according to the Heath–Carter method, using the following equations (J.E.L. Carter and B.H. Heath., 1990, J.E.L. Carter, 2002).

Somatotype component scores were obtained with calculations which can produce an exact decimal rating based on the measurements provided:

Endomorphy = $-0.7182 + 0.1415(X) - 0.00068(X^2) + 0.0000014(X^3)$

Where X = triceps skinfold + subscapular skinfold+ supraspinale skinfold

Mesomorphy = [(0.858 × humerus breadth) + (0.601 × femur breadth) + (0.188 × corrected arm girth) + (0.161 × corrected calf girth)] – (height × 0.131) + 4.50

Ectomorphy = HWR × 0.732 – 28.58 (if HWR ≥ 40.75),

Ectomorphy = HWR × 0.463 – 17.63 (if 40.75 > HWR> 38.25),

Ectomorphy = 0.1 (if 38.25 ≥ HWR).

HWR is height/ (cube root of weight) (J.E.L Carter and B.H.Heath., 1990, J.E.L Carter 2002).

Body Mass Index (BMI) was calculated as weight (kg)/ (height m)^2 according to standards recommended by The World Health Organization (WHO, 1987).

Statistical Analysis

In this study, the data obtained to evaluate the statistical package program SPSS 13.0 was used. All Results are given as mean±standard error of mean (SEM) (X±Sx) Differences between groups was investigated with the use of ANOVA followed by post hoc testing (Tukey's honestly significant difference, Tukey HSD). The level of significance was set at $p<0.05$.

Results

Meaningful differences were found at the age parameter according to comparison of male students studying in different faculties and colleges of our university

These differences were; between F1-F6 and F2-F4 at the level of ($p<0.001$), between F3-F4 at the level of ($p<0.01$), between F1-F3 and F2-F3 at the level of ($p<0.05$) "F6 < F3< F5< F1< F2< F4".

Meaningful difference weren't found between their height and body mass index ($p>0.05$). Body weights of male students were found significant. According to this between F1-F3 and F1-F6 at the level of ($p<0.05$), between F1-F2 at the level of ($p<0.01$). It was determined as "F1<F4<F5<F3< F6<F2" (Table 1).

At this study, meaningful differences weren't found when age and body weight average compared according to their faculties and colleges ($p>0.05$).

In the height average, meaningful difference was found between F1-F2 ($p<0.05$). No meaningful differences were found when the other schools compared each other ($p>0.05$). It was determined as "F2< F3< F6< F5< F4 < F1".

According to statitistically comparison of female students' body mass index values between faculties and colleges; meaningful differences were found between F1-F2 at the level of ($p<0.01$) and between F1-F6 at the level of ($p<0.05$). No meaningful differences were found when the other schools compared each other ($p>0.05$). It was determined as "F1< F3< F4 < F5< F6< F2" (Table 2).

According to statitistically comparison of male students' endomorphy values between faculties and colleges; while meaningful differences were found between F1-F2 and F1-F3 at the level of ($p<0.01$), and between F1-F6 at the level of ($p<0.01$), no meaningful differences were found between F1-F4 and F1-F5. It was determined as "F1< F4 < F5< F6< F3< F2".

According to statitistically comparison of male students' mesomorphy values between faculties and colleges; while meaningful differences were found between F1-F3 at the level of ($p<0.05$), no meaningful difference were found when other schools were compared each other ($p>0.05$). It was as "F3< F6< F2< F4 < F5< F1". According to statitistically comparison of male students' echtomorphy values between faculties and colleges; meaningful differences weren't found ($p>0.05$) (Table 3).

According to statitistically comparison of female students' endomorphy values between faculties and colleges; meaningful differences were found between F1-F2, F1-F3, F1-F4, F1-F5 and F1-F6 at the level of ($p<0.001$). No meaningful differences were found when the other schools compared each other ($p>0.05$). It was determined as "F1< F4 < F5< F3< F2<F6"

According to statitistically comparison of female students' mesomorphy values between faculties and colleges; meaningful differences weren't found ($p>0.05$). It was determined as "F3< F4 < F5< F6< F2< F1" According to statitistically comparison of female students' echtomorphy values between faculties and colleges; meaningful differences were found between F1-F2 at the level of ($p<0.001$), and between F1-F6 at the level of ($p<0.01$). No meaningful differences were found when the other schools compared each other ($p>0.05$). It was determined as "F2< F6< F5< F3< F4 < F1" (Table 4).

Discussion and Conclusion

In this study, it was aimed to investigate somatotypes of Erciyes University students which were studying in different colleges and faculties.

In this study, minimum age average was seen students of F6, maximum age average was seen students of F4. Meaningful differences were found comparing faculties and colleges each other. Also, meaningful differences were not found at the female student's age parameter

The reason of finding this meaningful difference of age parameter of male students was thought that measured students lived in the same block of dormitory, were in different age and classroom groups. Meaningful differences were not found at the height average of male students according to comparison between colleges and faculties.

Only, it was found statistically meaningful difference between F1 and F2's female students according to age average. Underlying reason of that was thought that there were active volleyball and basketball players in F1's students and one of the ability identification criteria of these sports were being length. It was found meaningful difference between F1 and some other faculties according to body weight average. The reason of it was thought that F1's student had an active life so, they had a lower body fat percent

While the lowest and the highest body weight average of female was found at F1 students and F6 and F2 students respectively, meaningful differences were not found between body weight averages of female students. R.W. Boyce, E.L. Boone, B.W. Cioci (2008) was reported that obesity was increased because of not to doing exercise, also losing weight was related with exercise

N.M. Mirza, K. Kadow, M. Palmer, (2004) was observed that overweight had a relationship with high body fat and not to doing exercise. Studies which were done, were showed that exercising and living an active life had a positive effect on body weight

For population studies the Body Mass Index (BMI) can be used as a surrogate measure for body fatness (M. Deurenberg-Yap, G. Schmidt, W.A. Staveren, 2000). An important aspect of health related to nutritional status is body composition (C. Gamez, M.D. Ruiz-Lopez, R. Artacho, 1998).

At this study, it was seen that the lowest and the highest BMI average were F1 and F2 respectively but it was not found a meaningful difference at this parameter. While the lowest BMI average values of female students were found F1, the highest values were found F2 and F5 respectively. Meaningful differences were found between F1, F2 and F5.

H. Kaya and O. Özçelik (2009) was not found meaningful difference at the BMI parameter of different aged female students, they were found meaningful difference at the BMI parameter of different aged male students, Results of (G.. Sinirkavak, U. Dal, Ö. Çetinkaya, 2004)'s study were lower than our study, the reason of that was thought that volunteers in their study were active elite athletes. In this study most of the volunteers were not physically active people

D. Sevimli (2008) was reported that BMI values of individuals which were joined physical activities were lower than sedanteries and regular physical activities had a positive effect on individuals' BMI. A. Photiou et al. (2008) were studied on Hungary people and they reported that Hungarians were living a sedentary life, it had a negative effect on their body position and BMI. All of these studies were showed that physical activity had a positive effect on BMI.

It was known that as sport was needed for a healthy lifestyle, also sport branches had effects on somatotype, sport branches were chosen according to somatotypes. If we thought that phenotypes was under intensive effect of genetic and environmental factors, it was occurred how much sportive activities were important. That's why, there were somatotype differences between athletes and sedanteries, also between athletes according to sport types (A. Kamanli, R. Özmerdivenli, K. Karacabey, 2003).

Endomorphy

At this study, it was compared somatotype profiles of male and female students according to their faculties and colleges. While minimum endomorphy component average of male students was seen at F1, maximum endomorphy component average was seen F2, F3 and F5 respectively. It was found meaningful difference between F1 and F2, F3 and F5. Minimum endomorphy component average of female students was seen at F1. Meaningful difference was found at endomorphy component between F1 and all other faculties. Endomorphy component was described as body fatness.

This result was because of F1 students being less body fat values. N. Gupta, G. Balasekaran, S. Jalnapurkar, (2009) was found that endomorphy values of female university students were high. M.J. Munoz-Cachon, I. Salces, M. Arroya, (2007) were also found that endomorphy values of female university students were high in Spain.

A. Kamanli, R. Özmerdivenli, K. Karacabey, (2003) were expressed that while physically active students' endomorphy component levels were decreasing, inactive students' endomorphy component levels were increasing. In our study, finding meaningful differences between F1 male students and some other faculties, also F1 female students and all other faculties were showed that female university students had higher body fat values.

Mesomorphy

When mesomorphy values of male students were compared, the highest value was found at F1 students, the lowest value was found at F3 students. While mesomorphy component values were found meaningful between F1 and F3, meaningful differences weren't found between F1 and other faculties.

While the highest mesomorph value of female students was found at F1 students, meaningful differences weren't found F1 and other faculties. A. Kamanlı, R. Özmerdivenli, K. Karacabey, (2003) were expressed that while physically active students' mesomorphy values were high, but when they were compared with inactive students, meaningful difference was not found.

M.J. Munoz-Cachon, I. Salces, M. Arroya, (2007) were determined that highest values of Spanish male university were found as Mesomorphy.

Mesomorphy component was described as muscularity. Underlying reason of mesomorphy component values of F1 students were high, due to being more sportsmen in F1 students.

Ectomorphy

Meaningful difference was not found between male students at the echtomorphy parameter. When female students' echtomorphy components were compared the highest value was found at F1 students and the lowest values were found for F2 and F5 students. Meaningful difference was found between F1 and F2 and F5at the echtomorphy values of female students. Ectomorphy component was described as thinness and length of body. Because of F1 female students were being longer than female students of other faculties, this component values were found high. When all components were compared in all faculties except F1, Meaningful difference was not found

A. Kamanlı, R. Özmerdivenli, K. Karacabey, (2003) were reported that it was not found meaningful difference at the echtomorphy values of sedanteries and sportsmen. This study's results were similar like our study. Y. Bektaş, B. Koca Özer, T. Gültekin, (2007) were studied on female basketball players of different categories, were found somatotypes of young players as 4.1 for endomorphy, 3.28 for mesomorphy, 5.35 for echtomorphy and somatotypes of adults players as 4,28 for endomorphy, 4,03 for mesomorphy, 2,22 for echtomorphy. They were founded that mesomorphy and mesomorphy values increased according to age increased. In our study, our findings of female students'

mesomorphy values at the same age group were showed that sport had an effect on somatotype.

According to Heath-Carter Scale, somatotype component averages of male students studied in

Erciyes university were found Endo-mesomorphy as 3,43-5,01-2,6, somatotype component averages of female students were found mesomorphic endomorphy as 5,37-4,25-2,40. M.J. Munoz-Cachon, I. Salces, M. Arroya, (2007) were also found similar findings with our study. N. Gupta, G. Balasekaran, S. Jalnapurkar, (2009) were studied on Indian and Singaporean, while they were found Singaporean female students as balanced endomorphy, Indian female students as endomorphic mesomorphy, they were not found meaningful difference between them. While they were found Indian and Singaporean male students as endomorphic mesomorphic, they were not found meaningful difference between them.

It was seen that our students were similar with Spanish (M.J. Munoz-Cachon, I. Salces, M. Arroya, 2007), Indian and Singaporean (N. Gupta, G. Balasekaran, S. Jalnapurkar, 2009) students according to data which were obtained from our study.

As a result of the study, it was seen that female students were against obesity risk. It was thought that female students need more aerobic exercises. It was seen that exercise and active life style has a positive effect on body weight, BMI and somatotyp.

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Table 1. Characteristics of male students studying in different faculties and colleges of our university

Gender	**Faculty**	**n**	**Age(years) X±Sx**	**Height(cm) X±Sx**	**Weight(kg) X±Sx**	**BMI (kg/m²) X±Sx**
Male	F_1	137	22,43±0,15^{abc}	174,88±0,46^{a}	69,69±0,74^{a}	22,77±0,21^{a}
	F_2	52	22,67±0,24^{ab}	176,31±0,92^{a}	74,15±1,53^{bc}	23,87±0,48^{a}
	F_3	79	21,71±0,20^{d}	177,14±0,63^{a}	73,24±1,22^{bc}	23,32±0,36^{a}
	F_4	66	22,79±0,22^{a}	175,62±0,74^{a}	71,38±1,21^{abc}	23,11±0,33^{a}
	F_5	36	21,78±0,29^{abcd}	175,64±1,19^{a}	71,78±1,80^{abc}	23,28±0,50^{a}
	F_6	35	21,14±0,25^{d}	177,74±1,13^{a}	73,73±1,93^{c}	23,34±0,59^{a}
	TOTAL	405	22,21±0,09	175,94±0,30	71,76±0,50	23,17±0,15
		F	**7,086**	2,227	**2,389**	1,184
		p	**0,000*****	0,051^{NS}	**0,037***	0,316^{NS}

abcd: Vertical columns with different letters have significant differences between them ($p < 0.05$) (ANOVA variance analysis), BMI:body mass index;, NS: Not significant. ***p<0.00,1Values are expressed as mean±standard error of mean (SEM) (X±Sx)

Table 2. Characteristics of female students studying in different faculties and colleges of our university

Gender	**Faculty**	**n**	**Age(years) X±Sx**	**Height(cm) X±Sx**	**Weight(kg) X±Sx**	**BMI (kg/m²) X±Sx**
Female	F_1	61	21,00±0,16^{a}	164,07±0,70^{a}	55,86±0,85^{a}	20,75±0,29^{c}
	F_2	58	21,19±0,19^{a}	160,43±0,71^{b}	58,14±1,04^{a}	22,59±0,38^{a}
	F_3	33	21,12±0,22^{a}	161,39±1,21^{ab}	56,63±1,64^{a}	21,67±0,49^{abc}
	F_4	61	21,15±0,15^{a}	162,80±0,77^{ab}	57,85±1,07^{a}	21,81±0,36^{abc}
	F_5	35	21,14±0,22^{a}	162,14±1,05^{ab}	57,69±0,96^{a}	21,95±0,34^{abc}
	F_6	34	20,71±0,18^{a}	162,09±1,00^{ab}	59,21±1,72^{a}	22,46±0,51^{ab}
	TOTAL	282	21,07±0,07	162,26±0,36	57,48±0,48	21,82±0,16
		F	0,792	**2,521**	1,001	**3,421**
		p	0,556^{NS}	**0,030***	0,418^{NS}	**0,005***

abc: Vertical columns with different letters have significant differences between them ($p < 0.05$) (ANOVA variance analysis) BMI:body mass index;, NS: Not significant, **p<0.01, *p<0.05Values are expressed as mean±standard error of mean (SEM) (X±Sx)

Table 3. Comparison of somatotype profiles of male students studying in different faculties and colleges of our university

Gender	**Faculty**	**n**	**Endomorphy X±Sx**	**Mesomorphy X±Sx**	**Ectomorphy X±Sx**
Male	F_1	137	2,84±0,08^{d}	5,25±0,12^{a}	2,68±0,09^{a}
	F_2	52	4,06±0,24^{a}	5,02±0,17^{ab}	2,42±0,19^{a}
	F_3	79	3,87±0,18^{ab}	4,65±0,14^{b}	2,63±0,16^{a}
	F_4	66	3,39±0,16^{abcd}	5,05±0,13^{ab}	2,58±0,14^{a}
	F_5	36	3,57±0,27^{abcd}	5,08±0,21^{ab}	2,55±0,23^{a}

	F_6	35	3,79±0,30^{abc}	4,71±0,21^{ab}	2,70±0,25^{a}
	TOTAL	405	3,43±0,07	5,01±0,06	2,61±0,06
		F	**9,189**	**2,616**	0,367
		p	**0,000*****	**0,024***	0,871^{NS}

abcd: Vertical columns with different letters have significant differences between them ($p < 0.05$) (ANOVA variance analysis) NS: Not significant, $^{***}p<0.001$, $^{*}p<0.05$ Values are expressed as mean±standard error of mean (SEM) (X±Sx)

Table 4. Comparison of somatotype profiles of female students studying in different faculties and colleges of our university

Gender	**Faculty**	**n**	**Endomorphy X±Sx**	**Mesomorphy X±Sx**	**Ectomorphy X±Sx**
Female	F_1	61	4,03±0,14^{a}	4,44±0,17^{a}	2,98±0,15^{a}
	F_2	58	5,87±0,16^{b}	4,34±0,16^{a}	1,99±0,15^{b}
	F_3	33	5,72±0,26^{b}	4,02±0,23^{a}	2,40±0,22^{ab}
	F_4	61	5,47±0,19^{b}	4,10±0,16^{a}	2,45±0,14^{ab}
	F_5	35	5,69±0,22^{b}	4,24±0,20^{a}	2,28±0,17^{ab}
	F_6	34	6,04±0,21^{b}	4,30±0,18^{a}	2,12±0,19^{b}
	TOTAL	282	5,37±0,09	4,25±0,07	2,40±0,07
		F	17,785	0,764	5,049
		p	0,000***	0,576^{NS}	0,000***

ab: Vertical columns with different letters have significant differences between them ($p < 0.05$) (ANOVA variance analysis) NS: Not significant.$^{***}p<0.001$Values are expressed as mean±standard error of mean (SEM) (X±Sx)

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IMPLEMENTATION OF TEACHING OF PHYSICAL EDUCATION (PHYSICAL FITNESS)

Syed Kamaruzaman Syed Ali, **Julismah Jani**
Faculty of Sport Science, Sultan Idris Educational University, MALAYSIA
Email: s_kamaruzaman@yahoo.com / 29.01.2010 / 25.02.2010

Abstract

Purpose. The subject of physical education (physical fitness) is very important. Due to physical educator have to implement teaching and learning of physical education properly in secondary school. The objective of the study are a) to identify the level of the implementation of teaching and learning strategy, source and teaching material, facilities and equipment, and evaluation, b) to identify the relationship between the teaching and learning strategy, source and teaching material, facilities and equipment, and evaluation, c) to identify the most important aspect in teaching of physical education (physical fitness).

Method. In exposing an existence of connection between variables in research, a descriptive framework in terms of correlation research has existed to study the implementation on teaching of physical education (physical fitness). It is focusing on two or more variables data collected and identify the correlation of it.

Result. The level of implementation of physical education teaching and learning strategy (physical fitness) is moderate. While, the level of implementation of source and teaching material at moderate. And then, the level of implementation of facilities and equipment is moderate as well. However, the level of implementation of evalaution is high. Beside that, there was a relationship between teaching and learning strategy, source and teaching material, facilities and equipment, and evalutaion. Among those aspect, the most important aspect is teaching and learning strategy.

Conclusion. Teaching and learning strategy, source and teaching material, facilities and equipment, and evaluation, are important factors in the teaching of physical education (physical fitness). However, the most important aspect is teaching and learning strategy.

Keyword: Physical Education, Teaching, physical fitness.

Introduction

Physical Education subjects were core subjects in Malaysia, but still there is a problem in terms of implementation. Reports from Curriculum Development Centre (2001) on the implementation of Physical Education in schools in Kelantan and Sabah are part of Physical Education teachers are not in daily planning and existing curriculum, teachers do not write daily lesson plans properly, to train football school teams during Physical Education period, monitor student progress during Physical Education classes, and leave time used by Physical Education teachers for teaching other subjects. Divison of Planning and Educational Research Policy (2005) reported that the implementation of Physical Education subjects were given less compare to other subjects. It is because Physical Education is not included the critical subjects. In general, the management of schools considered the subject of Physical Education can be taught by teachers who are not options. Therefore, the Physical Education subject taught without giving serious emphasis on the importance of achieving the goals of Physical Education. Through the reports presented at the Seminar, E.H. Wee (2002) considers the whole teaching of Physical Education in schools is still low. Problems that exist in the implementation of the