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The Relationship Between the Daily Biorhythm and Skills Performance Level in Handball for Students of Physical Education Department at the Faculty of Education in Al-Azhar University

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Abstract: The research aims to identifying the following: (1) the biorhythm types of the first grade students of physical education department at the faculty of education in Al-Azhar University. (2) The relationship between some physiological and physical variables and the skills performance level in handball (3) the relationship between some physiological and physical variables and the biorhythm types of the first grade students of physical education department at the faculty of education in Al-Azhar University. (4) Differences between the residence and non-residence students in the academic hostel of the biorhythm types and in some physiological and physical variables, and the skills performance level in handball. The researcher has used the descriptive method, while 60 students represented the sample of the research aged between 18-21 years old, whom randomly chosen of the first grade students at the department of physical education in the faculty of education in al-Azhar University. The sample has divided to two equal groups each of 30 students. The first group is the residence students and the second group is non-residence students in the academic hostel, of the academic year 2010/2011. The researcher implemented the main application of the measurement and tests on topics onto the sample of the research from 31.10.2010 for four days from 8.30 am to 12.30 pm. In addition, the researcher statistically treated the data by using the arithmetic mean, standard deviation, analysis of variation and "T" test for calculating the significant of the statistical differences. The most important. Conclusions were: (1) The morning type came first followed by the weak morning type, evening type, tends to evening type, evening type and then the non-regular type in the last rank. (2) There are significant differences between groups of resident and non-residents in pulse rate during rest and pulse rate directly after effort, and pulse rate ten minutes after effort, in favor of the resident group, while there were no statistically significant differences in the systolic blood pressure, diastolic blood pressure, and vital capacity. (3) There are statistical significant differences between resident and non-residents groups in the cardiovascular endurance, maximum speed, speed endurance and explosive power variables in favor of the resident group, while the differences were not statistically significant in the maximum oxygen consumption (VO2max.), flexibility and agility. The most important recommendations are: (1) all students of physical education department at the faculty of education in Al-Azhar University and in all physical education faculties must be residence in the academic hostels under the supervise of an organized and resolute leader and standardized nutritious program, so that their daily biorhythm become more organized leading to better performance.

Key words: Biorhythm types % Skills performance level

INTRODUCTION

The disagreement around the nature and state of the biorhythm may be one of the most important factors that affect the student's performance level during the practical lectures. During the researcher work as a teacher of handball in the Department of Physical Education, Faculty of Education, Al-Azhar University and during training to

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the handball basic skills assigned to the first grade students noticed many important things, therefore the researcher attempted to understand and verify the importance of the daily biorhythm in promoting handball skills performance level, as follows:

First: Some students live in the academic hostel in a full accommodation manner where sleeping, waking up and meals-containing all nutritious elements-are in determined dates. On the other hand, some students do not live in the academic hostel, as they were not able to meet its accommodation terms leading them to transferee between governorates that affect their sleeping, waking up and meals dates. In addition to exhaustion due to the long distances travel and accordingly affect their biorhythm regulatory leading to affect their performance level. Therefore, the researcher attempts to identify the effect of the biorhythm organization extent on the performance level of the resident and non-resident students in the academic hostel [1, 2].

Second: The department of physical education confronts the problem of the increased numbers of students leading to distributing them to many groups through the day from 8.30am to 4.30pm, which affects the student's biorhythm, therefore, consequently affects the performance level in handball [3].

Through the above mentioned, the researcher verifies the problem's sides that could be determined in attempting to reach the relationship between the daily biorhythm and skills performance level in handball for the students of Physical Education Department, Faculty of Education, Al-Azhar University.

Aims of the research: the research aims to identifying the following:

- The biorhythm types of the first grade students of physical education department at the faculty of education in Al-Azhar University.
- The relationship between some physiological and physical variables, and the skills performance level in handball
- The relationship between some physiological and physical variables and the biorhythm types of the first grade students of Physical Education Department at the Faculty of Education in Al-Azhar University.
- Differences between the residence and non-residence students in the academic hostel of the biorhythm types and in some physiological and physical variables, and the skills performance level in handball.

Hypothesis of the Research:

- There are statistical significant differences between some physiological and physical variables, and between the skills performance level in handball in favor of the residence students in the academic hostel.
- There are statistical significant differences between some physiological and physical variables, and between the daily biorhythm types in favor of the residence students in the academic hostel.
- There are statistical significant differences between the residence and the non-residence students in the academic hostel in some physiological and physical variables, and the skills performance level in handball of the daily biorhythm types in favor of the residence students in the academic hostel.

MATERIALS AND METHODS

Method of the Research: the researcher has used the descriptive method as it suits the nature of the research.

Sample of the Research: aged between 18-21 years old, 60 students represented the sample of the research that were randomly chosen of the first grade students at the Department of Physical Education in the Faculty of Education in Al-Azhar University. The sample has divided to two equal groups each of 30 students. The first group is the residence students in the academic hostel and the second group is the non-residence students in the academic hostel, in the academic year 2010/2011.

Means of Collecting Data

The Skills Used in the Research: the researcher selected the skills assigned for the first grade student as follows: pivot whip pass, two-hand receiving, and high jump whip shot.

Measurements Related to the Anthropometric Variables: The restameter for measuring height, medical scale and age.

Measurements Related to the Physiological Variables: measuring each of blood pressure, pulse rate and vital capacity [4].

Measurements Related to the Physical Variables: [5, 6]
Flexibility: Measured by the test of leaning trunk forward from standing posture

Agility: Measured by the test of zigzag running.

Cardiovascular Endurance: Measured by the test of running in the place.

Maximum Speed: Measured by the test of running 30 meters from a moving start.

Speed Endurance: Measured by the test of running 400 meters.

Explosive Power: Measured by the test of wide jump from stable posture.

Steps of Implementing the Research:

- The researcher has determined the daily biorhythm type.
- The researcher used four colleagues for assisting in organizing and taking measures.
- Implementing the main experiment:

The researcher implemented the main application of the measurement and tests on topics onto the sample of the research (60 students) starting from 31.10.2010 lasting for four days from 8.30 a.m. to 12.30 pm.

Statistical Treatment: The researcher statistically treated the data by using the arithmetic mean, standard deviation, analysis of variation and "T" test for calculating the significant of the statistical differences.

Table 1: Analysis of variation results for identifying differences between the research groups divided according to the biorhythm type in the physiological variables

Variables	Variation source	Squares sums	Freedom degrees	Squares average	"T" value	Significant level
Systolic pressure	Between groups	135.071	4	33.768	0.612	Not significant
	Within groups	30.32579	55	55.138		
	Sum	316.650	59			
Diastolic pressure	Between groups	547.914	4	136.978	4.142	0.01
	Within groups	1819.070	55	33.074		
	Sum	3266.983	59			
Pulse rate in rest	Between groups	64.571	4	16.143	0.889	Not significant
	Within groups	998.162	55	18.148		
	Sum	1062.733	59			
Pulse rate directly after effort	Between groups	597.228	4	149.307	2.566	
	Within groups	3200.705	55	58.195		
	Sum	3797.933	59			
Pulse rate 10 minutes after effort	Between groups	68.172	5	17.043	0.549	Not significant
	Within groups	1707.228	55	31.041		
	Sum	1775.400	59			
Vital capacity	Between groups	45981686.615	4	11495421.654	0.381	Not significant
	Within groups	1659880485.035	55	30179645.182		
	Sum	1705862171.650	59			

Table 2: Differences significant between residence and non-residence students in the physiological variables

Variables	Group	Number	arithmetic mean	standard deviation	"F" value	Significant level
Systolic pressure	residence	30	118.8333	4.46506	0.719	Not significant
	non-residence	30	117.4667	9.39821		
Diastolic pressure	residence	30	79.0667	4.79176	0.925	Not significant
	non-residence	30	79.3000	5.62108		
Pulse rate in rest	residence	30	71.8333	2.97209	2.686	0.01
	non-residence	30	69.0333	4.87416		
Pulse rate directly after effort	residence	30	174.0667	6.62250	5.576	0.01
	non-residence	30	164.667	6.43446		
Pulse rate 10 minutes after effort	residence	30	78.8667	4.49316	2.615	0.01
	non-residence	30	75.3333	5.88003		
Vital capacity	residence	30	5459.7333	7581.70767	0.919	Not significant
	non-residence	30	4181.9667	704.30726		

Table 3: Analysis of variation results for identifying differences between the research groups divided according to the biorhythm type in the physical variables

Variables	Variation source	Squares sums	Freedom degrees	Squares average	"F" value	Significant level
VO2 Max.	Between groups	0.96	4	0.24	0.557	Not significant
	Within groups	2.361	55	0.43		
	Sum	2.457	59			
Flexibility	Between groups	73.578	4	18.395	0.896	Not significant
	Within groups	1129.272	55	20.532		
	Sum	1202.850	59			
Agility	Between groups	4.427	4	1.107	0.162	0.05
	Within groups	374.823	55	6.815		
	Sum	379.250	59			
Cardiovascular endurance	Between groups	2291.940	4	572.978	0.3.245	0.01
	Within groups	971.0643	55	176.557		
	Sum	12002.583	59			
Maximum speed	Between groups	8.247	4	2.062	4.515	Not significant
	Within groups	25.115	55	0.457		
	Sum	33.362	59			
Speed endurance	Between groups	301.526	4	75.381	1.487	Not significant
	Within groups	2788.624	55	50.702		
	Sum	3090.150	59			
Explosive power	Between groups	7973.179	4	1993.295	6.727	0.01
	Within groups	16297.004	55	296.309		
	Sum	24270.183	59			

Table 4: Differences significant between to the biorhythm types in the cardiovascular endurance, maximum speed and explosive power variables

Variables	Types	Arithmetic mean	Morning	Evening	not regular	morning weak	tend to evening
Cardiovascular endurance	Morning	163.000	-	5.9545	17.3158		
	Evening	157.0455	-	-	11.3613		
	not regular	145.6842	-	-	-		
	morning weak	162.333	-	-	-		
	tend to evening	158.5833	-	-	-		
maximum speed	Morning	5.0667	-	0.7917	0.8485		
	Evening	4.2750	-	-	0.568		
	not regular	4.2182	-	-	-		
	morning weak	0.0158	-	-	-		
	tend to evening	4.3250	-	-	-		
explosive power	Morning	264.333	-	28.5833	39.7017		
	Evening	235.7500	-	-	11.1184		
	not regular	224.6316	-	-			
	morning weak	248.500	-	-			
	tend to evening	242.1667	-	-			
Cardiovascular endurance	Morning	163.000	-	5.9545	17.3158	0.6667	4.4167
	Evening	157.0455	-	-	11.3613	0.2878	1.5378
	not regular	145.6842	-	-	-	16.6491	12.8991
	morning weak	162.333	-	-	-	-	3.75
	tend to evening	158.5833	-	-	-	-	-
maximum speed	Morning	5.0667	-	0.7917	0.8485	0.0509	0.7417
	Evening	4.2750	-	-	0.568	0.7408	0.05
	not regular	4.2182	-	-	-	0.07976	0.1068
	morning weak	0.0158	-	-	-	-	0.6908
	tend to evening	4.3250	-	-	-	-	-
explosive power	Morning	264.333	-	28.5833	39.7017	15.833	22.1666
	Evening	235.7500	-	-	11.1184	12.75	6.417
	not regular	224.6316	-	-	-	23.8684	17.5351
	morning weak	248.500	-	-	-	-	6.3333
	tend to evening	242.1667	-	-	-	-	-

Table 5: Differences significant between residence and non-residence students in the physical variables

Variables	Group	Number	arithmetic mean	standard deviation	"T" value	Significant level
VO2 Max.	residence	30	2.7267	0.20667	0.440	Not significant
	non-residence	30	2.7033	0.20424		
Flexibility	residence	30	12.8667	5.18442	0.540	Not significant
	non-residence	30	12.2333	3.79367		
Agility	residence	30	19.6333	2.44221	0.1927	Not significant
	non-residence	30	20.8667	2.51524		
Cardiovascular endurance	residence	30	158.4667	11.27015	2.276	0.05
	non-residence	30	150.3667	15.90377		
Maximum speed	residence	30	4.9267	0.75106	4.646	0.01
	non-residence	30	4.1500	0.052375		
Speed endurance	residence	30	72.3000	0.32496	6.604	0.01
	non-residence	30	62.8967	5.69788		
Explosive power	residence	30	251.3000	13.44760	5.435	0.01
	non-residence	30	227.9333	19.33004		

Table 6: Analysis of variation results for identifying differences between the research groups divided according to the biorhythm type in the height, weight and age variables

Variables	Variation source	Squares sums	Freedom degrees	Squares average	"F" value	Significant level
Passing	Between groups	1264.454	4	316.114	11.259	0.01
	Within groups	1544.146	55	28.075		
	Sum	2808.600	59			
Receiving	Between groups	1266.822	4	316.706	11.010	0.01
	Within groups	1582.161	55	28.767		
	Sum	2848.983	59			
Shooting	Between groups	216.542	4	54.135	10.158	0.01
	Within groups	293.108	55	5.329		
	Sum	509.650	59			

Table 7: Differences significant between the biorhythm types in the performance variables

Variables	Types	Arithmetic mean	Morning	Evening	not regular	morning weak	tend to evening
Pivot whip pass	Morning	24.6818	-	10.0152	10.7871	5.985	6.6818
	Evening	14.6667	-	-	0.7719	4.9167	3.3333
	not regular	13.8947	-	-	-	5.6886	4.1053
	morning weak	19.5833	-	-	-	-	1.5833
	tend to evening	18.0000	-	-	-	-	-
Two-hand receiving	Morning	23.3636	-	9.670	10.8373	4.947	6.6136
	Evening	13.6667	-	-	1.1404	4.7500	3.0833
	not regular	12.5263	-	-	-	5.8904	4.2237
	morning weak	18.4167	-	-	-	-	1.6667
	tend to evening	16.7500	-	-	-	-	-
High jump whip shot	Morning	7.0455	-	3.0455	4.5718	1.7955	2.3788
	Evening	4.0000	-	-	1.5263	1.2500	0.6667
	not regular	2.4737	-	-	-	2.7763	2.1930
	morning weak	5.2500	-	-	-	-	0.5833
	tend to evening	4.6667	-	-	-	-	-

Table 8: "T" value for identifying differences between residence and non-residence in the skills performance variables

Significant level	"F" value	Standard deviation	Arithmetic mean	Number	Variation source	Variables
0.01	14.994	2.41547	25.4000	30	Between groups	Passing
		3.74534	13.2000	30	Within groups	
0.01	15.484	2.34006	24.2000	30	Between groups	Receiving
		3.69607	11.8333	30	Within groups	
0.01	7.073	2.19848	6.8333	30	Between groups	Shooting
		2.14530	2.8667	30	Within groups	

RESULTS AND DISCUSSION

The results indicated that there are statistical significant differences between the biorhythm types, these differences are in favor of the morning type, followed by the morning weak type then the tending to evening type, the evening type and last comes the non-regular type. That commensurate to the fact that during the first half of the day the adrenal gland reaches its peak in secreting hormones in blood, this keeps the human life and activity, these hormones have great impact on the metabolic processes of food where it assist in turning proteins to carbohydrate. Moreover, keeping a stable portion of muscles glycogen depends on the adequate availability of these hormones, therefore the results illustrated that the morning type sample achieved a noticed improvement in performance through applying measuring in the morning leading to improving and progressing their performance level that relates to the nervous system efficiency.

The results confirmed that there are statistical significant differences between the two groups concerning pulse rate in rest, pulse rate directly after effort and pulse rate 10 minutes after effort. These differences are in favor of the residence group for all variables where the arithmetic means were higher than the non-residence group, while there are no statistical significant differences in the systolic blood pressure, diastolic blood pressure and the vital capacity.

Concerning the physical variables, the results illustrated that "T" value to identify differences between the residence and non-residence groups is statistically significant at 0.05 and 0.01 levels in the cardiovascular endurance, maximum speed, and explosive power indicating the existence of a statistical significant differences between the two groups in these variables. These differences are in favor of the residence group, while there were no statistically significant differences in the VO2max, flexibility and agility.

Moreover, the results indicated the existence of differences between the biorhythm types in the skills performance variables as follows:

Concerning the pivot whip pass, the morning type came in the first rank with an arithmetic mean of 24.6818, followed by the morning weak, tending to evening, evening and the non-regular comes in the last rank. Concerning the two-hand receiving skill, the morning type came in the first rank with an arithmetic mean of 23.3636, followed by the morning weak, tending to evening, evening and the non-regular comes in the last rank. Concerning the high jump whip shot skill, the morning type came in the first rank, followed by the morning weak, tending to evening, evening and the non-regular comes in the last rank.

Differences exist between the two research groups in the variables on topics, in favor of the residence in the academic hostel group.

CONCLUSIONS

- The morning type came first followed by the weak morning type, evening type, tends to evening type, evening type and then the non-regular type in the last rank.
- There are significant differences between groups of resident and non-residents in pulse rate during rest and pulse rate directly after effort, and pulse rate ten minutes after effort, in favor of the resident group, while there were no statistically significant differences in the systolic blood pressure, diastolic blood pressure, and vital capacity.
- There are statistical significant differences between resident and non-residents groups in the cardiovascular endurance, maximum speed, speed endurance and explosive power variables in favor of the resident group, while the differences were not statistically significant in the maximum oxygen consumption (VO2max.), flexibility and agility.
- There are significant differences between resident and non-residents groups in the skills performance variables in favor of the resident group.

Recommendation:

- all students of physical education department at the faculty of education in Al-Azhar University and in all physical education faculties must be residence in the academic hostels under the supervise of an organized and resolute leader and standardized nutritious program, so that their daily biorhythm become more organized leading to better performance.
- Organizing the academic schedule of the physical education faculties is necessary, so that practical lectures should conduct from 8.30 am to 12.30 pm where the students are in their top performance in this period.
- The necessity of conducting camps before the matches and especially in the matches conducted outside the country or in other continents so that organizing the player's biorhythm process.

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