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A Comparative Study in Knowledge Management among Physical Education Teachers in Public Education Directorates in Baghdad

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Abstract

Knowledge management is of a great importance for all institutions as one of the essential components for institutions' success, survival and growth. This is made through their ability to contribute to maintenance and development of a far sighted vision through which the institution expresses its future inspirations. In addition, it is the highly influential environmental power that reorganizes physical education teachers in directorates. This power leads to basic change in the institution's processes and to create the required strategy on time. It also contributes to improve transparency rates, level of documentation, knowledge sharing and communication flexibility.

Through the researcher's experience being a teacher in one of the Iraqi schools, and in Baghdad governorate in particular, she found that there is a variation in knowledge management in the sport education institution. Therefore, she decided to conduct a study on knowledge management, especially in the current situation that witnesses a war targeting all moral, social, cultural and cognitive infrastructures. Thus, the study aimed to find differences among physical education teachers in knowledge management for variables of gender and place.

The descriptive surveying method was applied with the comparative manner through the application of knowledge management scale which includes (36) paragraphs distributed on five fields on the sample of the study represented in teachers of physical education at Baghdad, Al Karkh and Al Rasafa directorates (1427 individuals divided into: 720 male teachers and 700 female teachers in the period from 15/12/2015 to 18/01/2016. After finishing answers, questionnaires were collected and audited. The researcher collected the degrees which were obtained by each individual in the sample for each paragraph on the scale in order to extract the total degree which is obtained by each individual.

After analyzing results, the researcher found that the sample of the study – teachers of physical education at Baghdad – in general are characterized with knowledge management and there is no variation due to Al Karkh and Al Rasafa areas, while the researcher found that there is a variation in knowledge management among male and female teachers for the sake of female teachers.

Keywords: knowledge management, teachers of physical education at Baghdad's Public Education directorates.

1. INTRODUCTION

After knowledge being a source of competition and creativity, institutions sought to exert organized, aware and guided effort in order to collect, categorize, pick and store all types of knowledge related to the activity of this institution and making it ready for participation among individuals, departments and units of this institution to raise the efficiency of decision making and organizational performance through knowledge management (Ibrahim Mohamed Hassan, 2007: 52).

Knowledge management is considered an organizational process to find, extract, organize, legalize and show information in a manner that enhances decisions of individuals working in the institution in the field of their work. The institution helps obtain deep understanding through its self-experiences and problem solving which are formulated by stakeholders to acquire, store, distribute and reflect knowledge in business processes to reach the best applications for the long-term competition and adaptation (Salah El Din Al Kebisi, 2014: 8). A successful teacher has to be a successful manager and should enjoy the ability and skill in practicing basic administrative jobs, fully aware of laws and systems and efficient in the job's technical, scientific and professional aspects. Therefore, the success and failure of physical education teachers depends on knowledge which they own. In addition, raising the standard of knowledge management for physical education teachers leads to raise school sports.

Accordingly, knowledge is important for contemporary institutions through goals which they seek to achieve. The main goal of knowledge management is to provide knowledge for the organization in a constant manner and translate it into a behavior which serves goals of the institution to achieve efficiency and effectiveness in order to plan knowledge efforts and organize it in a way that leads to achieve strategic and operational goals of the institution.

Knowledge management is of a great importance for all institutions as one of the essential components of institutions' success and ensures their survival and growth through their ability to contribute to maintenance and development of a far-sighted vision through which an institution expresses its future directions. In addition, it is also the environmental force which is highly influential in reorganizing physical education institutions in directorates. This force leads to basic change in the institution's processes and creates the needed strategy on time. In addition, it contributes to enhance transparency rate and the level of documentation, knowledge sharing and communication flexibility. Through the researcher's experience as a teacher in one of Iraqi schools and in Baghdad governorate in particular, she found that there was a contract in knowledge management in the sport education institution. Therefore, the researcher decided to conduct a study on knowledge management, especially in the current situation which witnesses a war targeting all moral, social, cultural and cognitive infrastructures. This led to the spread of administrative corruption reaching lack of interest in knowledge management and the institution's educational systems which raise the standard of administrative and cognitive practices of physical an sport education lesson in addition to define the administrative and cognitive role played by the study population (physical education teachers).

Due to the importance of physical and sport education in administrative, cognitive and educational aspects of schools, the researcher sought to study the topic of knowledge management for physical education teachers in variables of gender and workplace. Therefore, the study aimed to find the differences among physical education teachers in physical education due to variables of gender and workplace (Al Karkh and Al Rasafa).

2. PROCEDURES OF THE STUDY:

The descriptive surveying method with comparison was used to solve the problem of the study because the descriptive method aims to study the current situations of phenomena in terms of their characteristics, forms, relations and factors affecting them. (Rabhi & Osman, 2000: 44).

3. POPULATION & SAMPLE OF THE STUDY

The population of the study was selected from physical education teachers of middle, preparatory and secondary schools at physical education directorates in Baghdad from both genders (males and females) for the studying year (2014 / 2015). They are 2112 male and female teachers distributed in 1154 schools within formations of 6 public physical education directorates: (Al Karkh 1st, Al Karkh 2nd, Al Karkh 3rd, Al Rasafa 1st, Al Rasafa 2nd and Al Rasafa 3rd). A sample is the part which represents the original population and the model on which the researcher conducts his work (Wagih Mahgoub 2009, 149) as the sample of the study was selected randomly. The sample of the study consisted of 1420 male and female physical education teachers with a percentage of (67.2%) of the grand total showed in table (1):

Table (1): Number of male / female teachers for the year 2014 / 2015

Serial	Directorates	Total Population			Selected Sample		
1	Al Karkh 1st Education Directorate	316	150	166	200	100	100
2	Al Karkh 2nd Education Directorate	461	259	202	300	150	150
3	Al Karkh 3rd Education Directorate	286	170	116	200	100	100
4	Al Rasafa 1st Education Directorate	462	215	247	300	150	150
5	Al Rasafa 2nd Education Directorate	407	203	204	300	150	150
6	Al Rasafa 3rd Education Directorate	180	124	56	120	70	50
Total		2112	1121	991	1420	720	700

Knowledge Management Scale:

The knowledge management scale prepared by Shaza Hafiz was used. It included 36 paragraphs distributed to five fields as in table (2). The scale has five gradations (Likert) with psychometric and scientific bases. It was applied on similar samples in Iraqi environment (Shaza Hafiz, 2015: 134) as in annex (1).

Table (2) Fields of Knowledge Management Scale

Knowledge Management Field	Field Title	Paragraphs
First Field	Implicit Knowledge	9 Paragraphs
Second Field	Superficial Knowledge	7 Paragraphs
Third Field	Knowledge Generation & Acquisition	5 Paragraphs
Fourth Field	Knowledge Storage & Dissemination	10 Paragraphs
Fifth Field	Knowledge Application	5 Paragraphs
Total	5 Fields	36 Paragraphs

Main Trial:

The main trial was applied on the sample of the study: (physical education teachers at Baghdad, Al Karkh and Al Rasafa directorates) (1427 individuals divided into: 720 male teachers and 700 female teachers in the period from 15/12/2015 to 18/01/2016). With the help of the work team, a questionnaire in its final form was distributed on the sample to stress the necessity of selecting the respondent for a single option by ticking (√) opposite the suitable option expressing each respondent's point of view. The researcher also asked members of the sample to read instructions and answer carefully while selecting options. Finally, questionnaires were collected and audited. The researcher added the degrees obtained by each individual regarding each paragraph in the scale in order to extract these degrees and put them in special forms for statistical treatment using suitable statistical methods.

Statistical Methods:

Data were treated statistically through the use of Statistical Package for the Social Sciences (SPSS), version (22) according to the following rules: (percentage, arithmetic mean, proposed mean, standard deviation SD, skewness coefficient and T tests for independent samples).

4. DISCUSSION OF RESULTS:

Table (3) Description of Knowledge Management Scale & its Fields Generally to Determine Values

Knowledge Management Scale Fields / Statistical Method	Knowledge Application	Knowledge Storage & Dissemination	Knowledge Generation & Acquisition	Superficial Knowledge	Implicit Knowledge	Total Scale Degree
Number of paragraphs	5	10	5	7	9	36
Mean	33.35	24.18	18.36	33.24	17.5	126.6
Proposed mean	15	30	15	21	27	108
S.D	5.7	3.4	3.89	7.33	3.37	9.27
Skewness	-1.12	-0.76	-0.7	-0.05	0.2	0.79
Minimum	19	14	10	20	12	104
Maximum	41	30	23	46	24	153

Table (3) showed that the sample of the study (physical education teachers at Baghdad) is characterized by knowledge management as arithmetic mean was bigger than proposed mean. The researcher attributes this to the spread of modern technology in information storage through mobile phones, iPads, PCs and then circulation at any time. This characterized the sample with organization, perception, understanding and clearance. Therefore, the sample sought to raise its administrative cognitive levels and the levels of institutions to which they belong. Acquiring and distributing experience through the manner that helps achieve maximum level of productivity by knowledge creativity, storage and benefit from it to perform organizational

activities based on knowledge present actually. In addition, knowledge shall be developed in future and disseminating it among members of institution to achieve the biggest amount of organizational effectiveness to use it in improving organizational performance (Asmahan Maged Al Taher, 2012: 25).

Table (4) Differences among Male & Female Teachers in Knowledge Management Scale

Statistical Methods	Sample	Sample number	Mean	S.D	T Counted Value	Error Level	Significance Level	Difference Significance
Knowledge Management Scale	Male teachers	720	121.7	4.68	13.5	0.000	0.05	Significant
	Female teachers	700	138	7.1				

Table (4) showed that there is a difference between male and female teachers in knowledge management scale. Although both are characterized by knowledge management, female teachers were better than male ones in this scale. The researcher attributes this to the fact that female teachers are more expecting and perceiving of things as they are characterized by organization, accuracy, information storage and repetition. This characterized them in knowledge more than male teachers. Knowledge management differs from an individual to another based on individual's ability to recognize facts from clear understanding, thinking, perception, remembrance and learning. All these processes interact leading to make individuals commit certain behaviors based on their way of thinking and experience (Nasser Mohamed Saoud, 2011: 9). In addition, the latest developments in information and communication technology made it easy to store and transfer knowledge as it is a combination of skills, ideas, rules and procedures that lead actions and decisions (Alter, Steven, 2002: 70). It can be stored, treated and restored in need to change something and make individuals and institutions able to practice different activities more effectively (Don Hellriegle, Jonu :2003 428).

Table (5): Differences between Al Karkh & Al Rasafa Directorates in Knowledge Management Scale

Statistical Methods	Sample	Sample number	Mean	S.D	T Counted Value	Error Level	Significance Level	Difference Significance
Knowledge Management Scale	Al Karkh	700	127.18	9.4	0.91	0.363	0.05	Insignificant
	Al Rasafa	720	125.33	8.9				

Table (5) showed that there are no differences among individuals in the sample of the study (teachers at Al Karkh & Al Rasafa Directorates). The researcher attributes this to different environment that leads to differences in knowledge sources. Since there is a close environment at Al Karkh & Al Rasafa Directorates in both conditions and possibilities in technology, knowledge and culture, this characterized the sample with knowledge management and there are no significant differences among those teachers. Variability of knowledge sources depends on internal and external environment. It is represented in general environment and information through its variables such as internet and libraries. In addition, the relation between big and small size institutions and relations among these institutions with each other as this relation leads to learn many skills and experience (Vail, Edmond, 1999: 18). Since environments are close, the researcher did not find any significant differences among education directorates in Baghdad.

5. CONCLUSION:

The researcher found that the sample of the study (teachers of physical education at Baghdad) is characterized in general with knowledge management and there are no differences between Al Karkh and Al Rasafa, while she found the least difference among male and female teachers for the sake of female ones.

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Annex (1): Knowledge Management Scale

Serial	Paragraph	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
1	Specialized teachers do not posses ability to judge things based on their internal abilities					
2	Many specialized teachers have previous experience that helps them perform their work					
3	Specialized teachers have skill in performing work and it cannot be acquired only through reading					
4	Physical education teachers are often busy in ways of developing lessons					
5	Many teachers depend on deep thinking of anything related to performing lesson activities & directorate					
6	Specialized teachers do not enjoy the experience that distinguishes them and pushes them towards the better					
7	The teacher owns necessary cognitive efficiencies to perform their tasks in various fields and activities					
8	Specialized teachers have clear and flexible thinking and ability to expect what is new					
9	Specialized teachers have skills in securing successful solutions of problems					
10	Specialized teachers are interested in reviewing information about physical and sport education					
11	Specialized teachers are interested in reviewing different types of sciences					
12	Specialized teachers do not own knowledge store of literature & books					
13	Specialized teachers are able to teach students and direct them in research & development programs					
14	Specialized teachers are interested in ideas and suggestions of students					
15	Specialized teachers own knowledge of what is new in technique of their work					
16	Specialized teachers do not follow more than one method in translating knowledge they own to be clear and applicable					
17	The directorate use methods (i.e. dialogues and face-to-face experience exchange) as a mean to generate new knowledge					
18	All specialized teachers in the directorate, with their					

	different standards, do not contribute to knowledge generation					
19	The directorate depends on specialist training programs to raise experiences and knowledge of specialized teachers					
20	The Public Directorate of Education depends on internal experience (i.e. Specialized education teachers in cooperation with the directorate of preparing, training and development)					
21	Specialized teachers acquire knowledge through exchanging visits and experiences with other directorates					
22	Specialized teachers store information through a PC					
23	Specialized teachers store information through a special notebook					
24	Knowledge dissemination in the directorate's environment raises skills and personal knowledge of specialized teachers					
25	The directorate encourages dialogues, seminars and direct meetings among workers					
26	Specialized teachers in the directorate do not have necessary skills to deal with modern technology					
27	The public directorate of education provides modern means of communication to facilitate information exchange (internet)					
28	The teacher contributes to publish directions and information about the latest sport training methods					
29	Specialized teachers have good training on using modern information computer devices					
30	The directorate provides professional development& continuous learning program for specialized teachers					
31	Teachers acquire important information and directions by specialized teachers					
32	In applying knowledge, the directorate depends on the difference of internal experience that is cognitively variable					
33	The public directorate uses many scales to control knowledge applied there					
34	The directorate encourages specialized teachers to apply new ideas					
35	The directorate uses knowledge management to support creativity in its activities					
36	The teacher's ability to apply essential principles and techniques in the field of his specialization					

AN EDUCATIONAL PROGRAM USING MICRO-TEACHING STRATEGY TO LEARN SOME GROUND MOVEMENTS IN ARTISTIC GYMNASTICS

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Abstract

The study aims to prepare an educational program using micro-teaching method to learn some ground movements using artistic gymnastics. The researchers proposed that there are statistically significant differences between results of pre- and post-tests of both groups (empirical and control groups) for the empirical group. The sample of the study included 24 students at the fifth primary grade among students of Baghdad-Al Rasafa 3rd Educational Directorate. Results of tests showed that micro-teaching is effective in learning some ground movements using artistic gymnastics. The researchers recommended that is necessary to use micro-teaching to learn motor skills in general and ground movements in gymnastics in particular.

Keywords: Educational program, micro-teaching strategy, ground movements in gymnastics

1. INTRODUCTION

The world in which we are living is characterized with rapid changes and is renewing concerning additions and changes that happen to knowledge as they help build human society. Educational process contributes greatly to raise the scientific standard in thought, application, methodology and content because the concern in science and the educated people leads to advance in building intact human society to become a real power in achieving mental, intellectual, scientific, economic, social and political changes. A lot of educational and psychological studies agreed on the existence of individual differences among students even those who are at the same age, at the same social setting and even the twins who were created from the same sperm, living inside one uterus and one abdomen. Those differ among themselves at the level of mental, physical and psychological abilities. Facing this reality, we cannot direct education to a group of student using the same way. Education should be variable dealing with students as close individuals and groups instead of dealing with them as one group. Therefore, the modern theory focused on the role of students and made it the center of educational process, while it said that the role of teachers has to be easy, organized and guiding which cannot be done unless there is variability in teaching and education methods. Hence, the significance of the study comes in the use of micro-teaching strategy in learning some ground movements using artistic gymnastics.

Problem of the Study:

The problem of the study lies in lack of using modern methods in learning motor skills in general and gymnastics skills in particular. This led to weak learning y middle stage students by learning ground movements which form a great obstacle in developing and improving movements in gymnastics. Therefore, the researchers decided to use one of the modern methods in learning motor skills to answer the following question:

- Did the educational program by using micro-teaching helps in learning some ground movements using artistic gymnastics for middle stage students?

Objectives of the Study:

1- Preparing an educational program using micro-teaching strategy to learn some ground movements using artistic gymnastics.
2- Identify the effect of the educational program on learning some ground movements using artistic gymnastics.

2. METHODOLOGY & FIELD PROCEDURES OF THE STUDY:

The nature and goals of the study determine its methodology. A methodology is “the manner followed by individuals in order to reach certain goals” (Akram Khataiba, 1997: 19). Both researchers used the empirical method using two equal groups (empirical and control groups) as it is consistent with achieving goals of the study.

Population & Sample of the Study:

The population of the study was selected using purposive method represented by students of primary middle secondary grade from secondary male advanced stage among students of Baghdad-Al Rasafa 3rd Educational Directorate for the year 2014 / 2015. They are 140 students divided into 4 sections. As for the sample of the study, it was selected randomly using poll. Students were 35 with a percentage of 25% from population of the study. Since there were two physical education teachers, both researchers decided to divide the sample of the study into two equal groups using double numbering. The empirical group obtained even numbers and the control group obtained odd numbers. The number of students was (12) for each group. The exploratory group was (6) students after eliminating five students because they did not complete procedures of the study, so members of the sample were 24 students.

Sample Homogeneity:

The researchers made sample homogeneity for the variables: (length, mass and age) through the use of skewness coefficient as shown in table (1):

Table (1) sample homogeneity for the variables: (length, mass and age):

Variable	Number	Mean	S.D	Median	Skewness
Length / cm	24	142.8	2.920	143	0.205
Mass / kg	24	37.11	2.981	38	0.895
Age / month	24	137.1	3.98	135	1.582

Table (1) asserts that skewness values were all less than 3± and all measurements achieve normal curve. This shows sample homogeneity. After that, the researcher conducted equalization between both groups of the study to adjust variables that affect the results of pre-tests.

Sample Equalization:

The sample of the study was divided into empirical and control groups using double numbering method with a poll. In order to avoid bias of division for any group and to keep scientific subjectivity, equalization was made in results of pre-tests between both groups to adjust the variables which affect results of the study as shown in table (2):

Table (2): Sample equalization in results of pre-tests for the empirical and control groups

S	Statistical Treatment / Tests	Measure Unit	Empirical Group		Control Group		T Counted Value	Significance
			Mean -	S.D ±	Mean -	S.D ±		
1	Frontal roll squat	Degree	1.666	0.778	1.916	0.900	0.728	Insignificant
2	Frontal roll open	Degree	1.416	0.670	1.833	0.577	1.634	Insignificant
3	Back roll squat	Degree	1.083	0.668	1.333	0.651	0.928	Insignificant

(*) freedom degree = 22 at significance level (0.05) T-test tabulated value = 2.074 (Van Dalin 652.1993)

Field Procedures of the Study:

Determining Skills:

The researchers selected some ground movements related to gymnastics based on educational goals and items of the course for sport activities related of first middle grade students prepared by the public directorate of education for developing courses with the opinion of a group of experts to determine some ground movements of gymnastics according to their importance that are consistent with the subject of the study.

Setting Tests:

After determining ground movements, the researchers selected consistent options based on rules of gymnastics by making each student perform each selected movement three times, photograph performance, present it to a group of experts, grade each movement and finally list it in a special form for evaluating the performance of each student.

Pre-tests:

Pre-tests were performed on Wednesday 25/02/2015 at eight o'clock am for both empirical and control groups. The researchers fixed circumstances related to pre-tests and their conduction method to maintain the variables that may affect results of post-tests.

Main Trial (Educational Program):

Both researchers prepared an educational course according to requirements of micro-teaching methods based on educational references of teaching methods related to physical education. After scientific preparation, the program was presented to a group of experts and specialists in the field of physical education to legalize it by the manner that serves the subject of the study and to be applicable on the sample of the study to learn ground movements. There were 12 educational units divided into 4 weeks (3 units each week) after the approval of the school's management.

After performing pre-tests, the educational program was applied in the first educational unit on 02/03/2015. The main empirical group was divided into two groups. Each group is 6 students teaching only one movement for both groups with focus on implementation stages (preparation, training and follow-up) and giving the feedback to be used by implementing the special motor duty (movement application, movement criticism and movement reapplication). The duration of the educational unit is 15 minutes and then preparation of a discussion seminar about the educational unit that was recorded and given a final grade for the performance of each study through comparison with model performance.

Post-tests:

After application of the educational units of the program, post-tests were conducted on Monday 06/04/2015 for all tests and for both groups. The researchers considered provision of the same circumstances to avoid the effect of variables on results of tests.

3. DISCUSSING RESULTS OF PRE AND POST-TESTS FOR BOTH GROUPS:

Table (3): Arithmetic means, Standard Deviations S.D, means difference, standard error of differences and T counted value for results of pre- and post-tests of the empirical group.

S	Statistical Treatment / Tests	Measure Unit	Pre-tests		Post-tests		Means Difference	Standard Error of Differences	T Counted Value	Significance
			Mean -	S.D ±	Mean -	S.D ±				
1	Frontal roll squat	Degree	1.666	0.778	6.916	1.164	5.250	0.410	12.78	* Significant
2	Frontal roll open	Degree	1.416	0.670	6.583	1.083	5.166	0.321	16.057	* Significant
3	Back roll squat	Degree	1.083	0.668	5.333	0.492	4.250	0.278	15.252	* Significant

(*) T-Test tabulated value = 2.201, significance level 0.05 and freedom degree 11

Table (3) shows that there is an improvement in performance of the empirical group in learning all ground movements under study. The researchers attribute the reason for improving performance of the empirical group to the effectiveness of the prepared training program using micro-teaching strategy in the learning of empirical group's students of ground movements in artistic gymnastics. The educational programs greatly helped students learn ground movements through video projections of recorded lessons as it helped students to fix correct performance, avoid mistakes as well as interaction of students with each other with teachers by preparing discussions about motor duty, model performance and determine errors which led to enhance relations, increase self-trust of students and trusting their teachers in addition to prepare suitable educational atmosphere. Moreover, feedback facilitated learning, especially at planning and implementing motor duty for a second time for the same movement, trying to avoid errors and trying to solve them through noticing model work of performing the movement which promoted fixing correct performance and overcoming mistakes by students and the ability to enhance learning. This was asserted by (Safwat, 1983) that the best method of feedback in micro-teaching is to watch students' performance, analyzing their performance and planning to teach once again (Mohamed Youssef Safwat, 1983: 20). As for Singer, 1976, he found that "the learner watching his performance and then watching model performance make him avoid errors in following attempts as it is considered an effective method to discover mistakes and correct them" (Singer, R.N:1976 .P 316).

4. DISCUSSING RESULTS OF PRE AND POST-TESTS FOR THE CONTROL GROUP:

Table (4): Arithmetic means, Standard Deviations S.D, means difference, standard error of differences and T counted value for results of pre- and post-tests of the control group.

S	Statistical Treatment / Tests	Measure Unit	Pre-tests		Post-tests		Means Difference	Standard Error of Differences	T Counted Value	Significance
			Mean -	S.D ±	Mean -	S.D ±				
1	Frontal roll squat	Degree	1.916	0.900	5.250	1.138	3.333	0.355	9.381	* Significant
2	Frontal roll open	Degree	1.833	0.577	4.416	0.668	2.583	0.792	11.285	* Significant
3	Back roll squat	Degree	1.333	0.651	3.833	0.717	2.500	0.904	9.574	* Significant

(*) T-Test tabulated value = 2.201, significance level 0.05 and freedom degree 11

Table (4) shows results of the control group in learning ground movements in artistic gymnastics as the table shows the improvement in the control group's performance in learning ground movements, but this improvement was in a little percentage. It was compared with learning the empirical group's learning. The researchers attribute this improvement logically as a result of the control group's performance of some exercises related to ground movements of gymnastics and as a result of the continuous repetition of ground movements during application of the educational course prepared by the physical education teachers and within the prepared educational methods.

5. DISCUSSING RESULTS OF PRE AND POST-TESTS FOR THE CONTROL GROUP:

Table (5): Arithmetic means, Standard Deviations S.D, means difference, standard error of differences and T counted value for results of pre- and post-tests of the empirical and control groups.

S	Statistical Treatment / Tests	Measure Unit	Empirical Group		Control Group		T Counted Value	Significance
			Mean -	S.D ±	Mean -	S.D ±		
1	Frontal roll squat	Degree	6.916	1.164	5.250	1.138	3.546	* Significant
2	Frontal roll open	Degree	6.583	1.083	4.416	0.668	5.895	* Significant
3	Back roll squat	Degree	5.333	0.492	3.833	0.717	5.970	* Significant

(*) T-Test tabulated value = 2.074, significance level 0.05 and freedom degree 22

Table (5) shows that there are significant differences in results of post-tests for the empirical and control groups for the sake of the empirical one and at all tests. The researchers attribute these differences to the effectiveness of the prepared educational program using micro-teaching strategy. Both researchers benefited from the positive sides of this method in learning process by implementing all educational units due to a scientific and correct planning as Thamer Mohsen & Sami Al Safar: 1988, 19 refer that "scientific training is the optimal method that should be followed by the teacher in making students adapt to face challenges as well as acquire experience that enables them to solve problems facing them. Mohamed Mahmoud Al Heela: 1999, 64 asserts that during implementation of the educational program effectively, a student's general performance is greatly enhanced. Then, students are able to acquire extra benefit in developing new learning about how to learn skills. The teacher used the method of explanation and presentation which greatly helped to facilitate learning. Dhafer Hashem: 2002, 120 asserts that in order to make learning start a correct one there must be explanation, presentation and training on correct performance and focusing on it till fixing and fixing performance. In addition, the use of feedback continuously to enhance performanvce helped enhance learning as feedback plays a great role in students' learning whether feedback during implementation of movement or after implementation through evaluation of performance by student to himself or through students who assess their colleagues. This was asserted by (Schmide & Wrisberge: 2000 .p282) as he said that "feedback increases individual's energy, motivation, promotion of correct performance and avoid wrong performance". Scott, 582000 found that the student's trust will increase through evaluation of colleague students in discussion sessions. There was a notable improvement in acquiring self-trust. This was reflected on performance and presenting good model for application. In addition, a student's knowledge of his performance will increase

learning movements especially if evaluation comes through students who participate in the same performance of the movement, especially in small numbered groups as a single person performs, who is the student, and his performance is monitored by other partners.

6. RECOMMENDATIONS:

1- Using micro-teaching strategy in learning ground movements of artistic gymnastics.
2- Conducting similar studies of micro-teaching strategy and various age categories for all games.
3- The researchers recommend the directorate of sport education and activity to provide requirements of all sport games, especially artistic gymnastics.

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EVALUATION OF NICOTINE EFFECTS ON MUSCLE PERFORMANCE UNDER WINGATE ANAEROBIC TEST CONDITION

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Abstract

Nicotine is a naturally occurring addictive alkaloid and in some cases, is a fatal drug. The long-term noxious effects of nicotine have been reported by means of publications to stop the use of nicotine in the form of tobacco. In this study the use of nicotinic substances was tested during Wingate Anaerobic Tests (WAnT) on collegiate football athletes. These tests had three possible results: ergogenic, ergolytic or no effect. The subjects were 12 University of Ataturk University football players between the ages of 19 - 23. They did a series of two tests on a Monarch cycle ergometer for 30 seconds at a time on two separate days. One day post-nicotine gum consumption, the another day post-placebo gum consumption. The data received was considered significant with a p-value ≤ 0.05. This experiment showed nicotine's effect on: peak anaerobic power ($P = 0.34$), anaerobic capacity ($P = 0.92$) and anaerobic fatigue percentage ($P = 0.33$) in the human body during a WAnT. So, the data received from this experiment were concluded not to be statistically significant.

Key Words: Nicotine, Wingate test, Anaerobic, Muscle Performance

1. INTRODUCTION

Nicotine is a colorless and strong liquid alkaloid that has found in all tobacco plants. It is used in drugs such as: smokeless tobacco, cigarettes and cigars (Metz et al., 2004). There is a lot of researches for suggesting that tobacco has many harmful long-term effects. Several studies have shown that caffeine and creatine have improved muscular performance in the human body during exercise, whereas little has been published regarding nicotine's effect on the human body during exercise conditions (Racette, 2003; Spriet, 1995). There is no published work about the effect of nicotine on the human body during a supra-maximal exercise test such as the Wingate Anaerobic Test (WAnT). The effects of nicotine in the body vary under resting and exercising conditions. Studies by Symons and Stebbins (1996) showed that nicotine infusions during resting states caused hypertension, decreased cardiac output, increased blood pressure and decreased heart rate. The study by Narkiewicz et al. (1998) showed that smoking caused to increase norepinephrine and increased blood pressure. Van Van Duser and Raven (1992) suggested that smokeless tobacco had strong sympathetic nervous system stimulation as well. Their findings concluded smokeless tobacco decreased endurance performance by means of an increase in heart rate and plasma lactate concentrations. Landers et al. (1992) showed that ergogenic effects in regards to vigilance, rapid information processing, state dependent learning and retention of paired associates. Escher et al. (1998) attempted to demonstrate the significance between smokeless tobacco, reaction time and strength in athletes. The results showed that tobacco did not have any effect on reaction time, but had a significant effect on decreasing strength. The experimenters were unsure if the effect was a substance in the smokeless tobacco producing an ergolytic effect, or if tobacco withdrawal stimulates an ergogenic effect. Muscular performance is calculated anaerobically by peak power, mean power and percent fatigue. The WAnT is a supramaximal exercise for 30 seconds against a pre– determined force load usually 7.5% of body weight in kilograms. Gullstrand and Larsson (1999) reported eight investigations showing a mean reliability of r=0.94+/-3SD. This is in agreement with studies by Bar-Or (1987). Therefore, the WAnT is proven to be a reliable test. The WAnT also parallels football because they both last short durations of time. Severson et al. (2005) declared that during the mid-1980's and the early 1990's the use of smokeless tobacco among professional baseball players was about double the percentage of the entire population. . Lombardo (1986) stated that one-third of Texas varsity football and baseball players used nicotinic substances in the form of smokeless tobacco. This study made the following assumptions: 1. The nicotine levels in the nicotine chewing gum were high enough to affect the EPSP's in a human body. 2. The conditions of the experiment were parallel between the two test days. 3. The test subjects were honest and followed the protocol before the experiment. 4. The WAnT was a valid and reliable anaerobic test. By regarding to this matter that f ootball is a game of explosive activity and muscular strength. A normal play usually lasts only a few seconds. These short durations of play stress the importance of anaerobic activity, or fast twitch muscle performance. A WAnT is a good test for football athletes because it is consists of all explosive actions and fast twitch muscular activity and by attention to all researches that was inconclusive based on the variety of results showing ergogenic, ergolytic and no significant statistical difference, the study purpose is illustration of the nicotine effects on anaerobic exercise during a WAnT.

2. MATERIALS AND METHODS:

Twelve football players of Ataturk University were tested by using of a WAnT on two separate days (N=12). All test subjects were male and they were from Turkey. One day consisted of administering nicotine gum and the other day a placebo was administered. Each subject was given a one week period of recovery between tests. This was a single-blind experiment (test-retest). Therefore, only the researchers knew which gum was administered for each day. The statistical analysis was performed using a paired student's *t*-test. Testing was performed on Monark bicycle ergometers (Monark 834E). The procedures required a subject, a timer and two counters for each test. Each test subject wore a t-shirt, athletic shorts, and athletic shoes. The subject randomly was administered a piece of chewing gum by the researcher. The subject chewed the piece of gum for 30 minutes to allow optimal peak time for the possibility of 4 mg nicotine to enter the bloodstream. This is in agreement with clinical studies performed by Van Duser and Raven (1992). During the time of chewing the gum the test subject had his weight taken and subsequently the brake force set up on the Monark cycle ergometer. The seat height was adjusted allowing a slight bend in the knee when the pedals were at the bottom of the revolution. Then the subject had a two minute warm-up cycling with no resistance at a moderate pace. The force was then applied by dropping the weight holder. The timer began counting with a stop watch for 30 seconds and called out time intervals every five seconds. As the timer counted the subject was encouraged to keep pedaling as hard as he could by the researcher, timers and counters for the duration of the experiment. One counter counted pedal revolutions during the first, third and fifth time intervals. The other counter counted pedal revolutions during the second, fourth and sixth time intervals. After the 30 seconds were up the resistance was removed from the Monark cycle ergometer and the subject cooled down until he was comfortable with stopping. The data was used to calculate peak muscle power, average muscle power and rate of fatigue. One week later, the subject reproduced this experiment by using of the other piece of nicotine or placebo gum that was not administered during the first test.

3. RESULTS:

The purpose of this study was to determine if nicotine had a positive, negative, or no effect on muscle performance in the human body during a WAnT. The literature review showed that previous researches were inconclusive. The results of this study showed the effects on non-tobacco using collegiate football players during a WAnT. The ages, height, weight and brake weight are shown in Table 1. Brake weight was the prescribed force used as resistance for the WAnT calculated by 7.5% multiplied by the body weight (kg) of the test subjects and rounded to the nearest 0.5 kg.

Table 1: Demographics of the participants.

Test Subjects (N=12)	Mean	SD	Range
Age	20.8	1.36	19-23
Height (in)	71.23	2.5	66-75.5
Weight (kg)	92.5	12.4	74.5-105.5
Brake Weight (kg)	7.1	0.91	6-9

Table 1 reports the demographics of the 12 test participants. There were little differences in the ages and brake weights of the subjects, but there were significant differences in the heights and weights of the subjects.

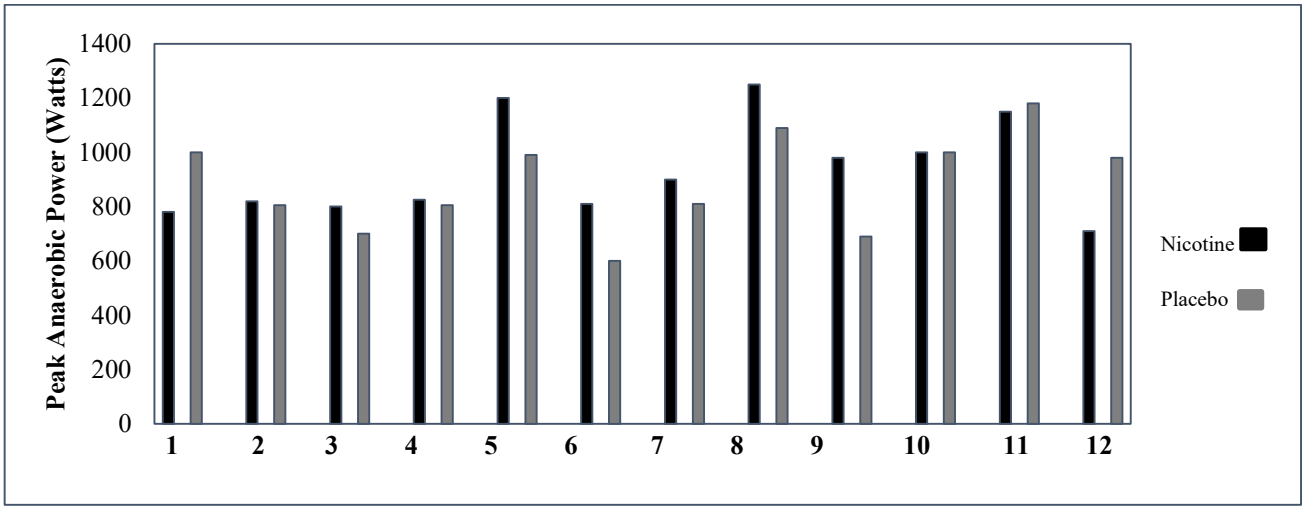

Figure 1: Results for peak anaerobic power.

Figure 1 shows that the data collected from all twelve subjects on peak anaerobic muscle power comparing the effects of nicotine verses a placebo. Fifty percent of the Subjects (6 of 12) showed an increase in peak anaerobic power during the nicotine trial. Twenty-five percent of the subjects (3 of 12) had no difference in peak anaerobic power output. Lastly, 25% of the subjects (3 of 12) showed a decrease in muscle power during the nicotine gum experiment in comparison with the placebo gum. Table 2 reports a wide variety of peak anaerobic power values obtained from a paired student's *t* – test. The values showed that the mean scores were higher by 47 Watts in the nicotine gum trials. Standard deviation values were also more prominent in the nicotine gum with a greater difference of 14 Watts. The p-value was greater than 0.05 (P = 0.34). Therefore, one cannot claim this as statistically significant data.

Table 2: Comparison of peak anaerobic power values for nicotine and placebo trials.

Nicotine Gum				**Placebo Gum**		
Mean	935			**Mean**	891	
95% CI	825.3 - 1050			**95% CI**	787.9 - 995.1	
SD	178			**SD**	163	
Median	881			**Median**	885	
t-score	1	**DF**	11	**P-value**	0.35	

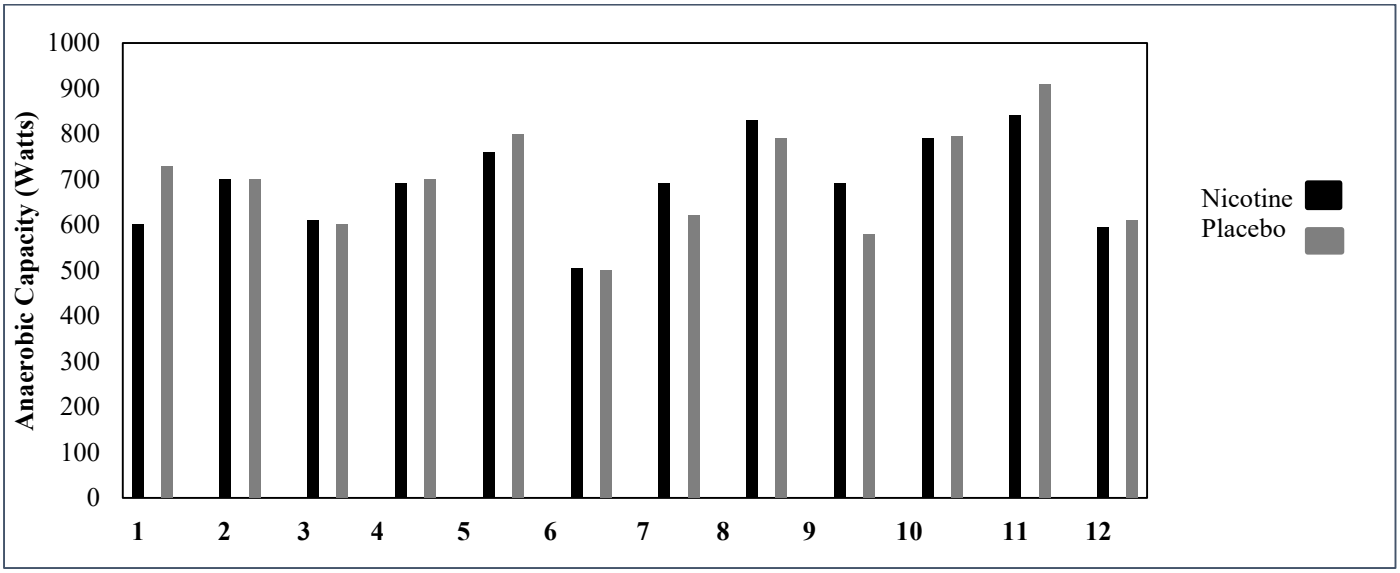

Figure 2: Results for anaerobic capacity.

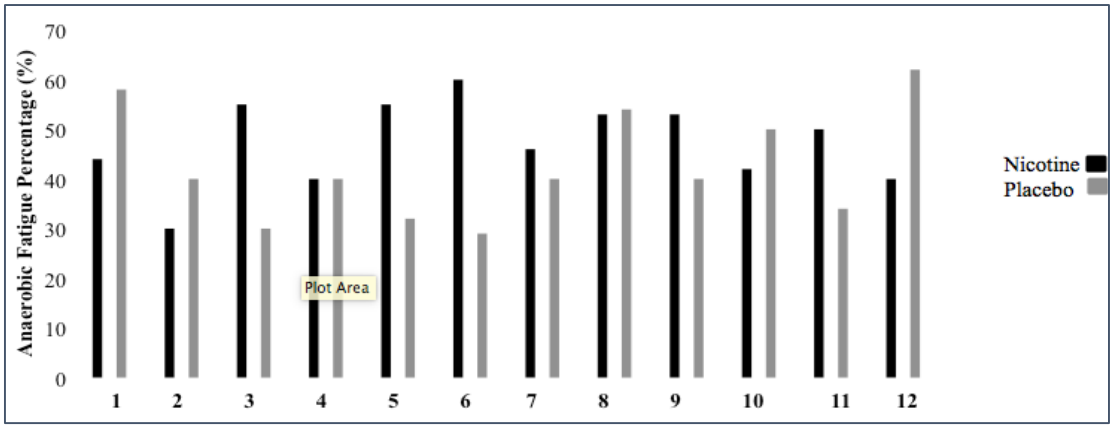

Figure 3: Graph results for percentage of anaerobic fatigue.

Figure 2 indicates that the data collected from all twelve subjects on anaerobic capacity or mean anaerobic muscle power output. The effects again show the values of nicotine in comparison with a placebo. Fifty percent of the subjects (6 of 12) showed an increase in anaerobic capacity during the nicotine trial. In contrast, 50% of the football players (6 of 12) showed a decrease in anaerobic capacity during the nicotine trial. Figure 3 shows the data collected from all twelve subjects on anaerobic fatigue. This comparison between nicotine gum and placebo gum was based on the percentage of decline in performance from the highest to lowest five second intervals throughout the 30 second experiment. A lower percentage rate for the experiment indicated a better effect of maintaining performance; a higher percentage rate indicated decrease in muscle performance. Fifty percent of the subjects (6 of 12) showed a greater percentage loss in the nicotine gum trial. Forty-two percent of the subjects (5 of 12) showed a lower percentage from nicotine gum. Finally, eight percent of the subjects (1 of 12) showed no difference from both trials of anaerobic fatigue. As seen in Table 3, the values for anaerobic capacity were similar. The mean scores were almost identical with nicotine scores edging placebo scores by a difference of 2 Watts. The nicotine standard deviation scores were 11 Watts smaller than the placebo. Because the resulting p-value of 0.92 was far from the 0.05 level of significance, this data was not statistically significant.

Table 3: Comparison of anaerobic capacity values for nicotine and placebo trials.

Nicotine Gum				**Placebo Gum**		
Mean	694			**Mean**	695	
95% CI	627 – 766.7			**95% CI**	618 – 772	
SD	111			**SD**	122	
Median	680			**Median**	687	
t-score		0.1	**DF**	11	**P-value**	0.93

Table 4: Comparison of percentage of anaerobic fatigue in nicotine and placebo trials.

Nicotine Gum				**Placebo Gum**		
Mean	46%			**Mean**	44%	
95% CI	43% – 54%			**95% CI**	36% – 51%	
SD	9%			**SD**	12%	
Median	49%			**Median**	42%	
t-score		1.01	**DF**	11	**P-value**	0.34

As seen in Table 4, the values are comparable. The subjects had a larger drop off in anaerobic fatigue from highest peak interval to lowest end interval when the percent score was greater. Consequently, mean scores were higher in nicotine gum by a difference of 4%. Nicotine gum had a lower standard deviation by 2%. The resulting p – value was 0.33.

4. DISCUSSION:

Landers et al. (1992) described that athletes also believe that smokeless tobacco enhances performance by preventing dry mouths, improving concentration, improving reaction time and providing an arousal effect. These study results are in contrast with research done by Escher et. al. (1998) who believed that smokeless tobacco decreased muscular strength. In the future it is recommended to further investigate the effects of nicotine and muscular performance. Recommendations for future research on nicotine and muscle performance include: 1. Increasing the sample size. This will ensure a larger validity of the experiment. 2.Using cycle ergometers with computerized systems that automatically count pedal rate and determine the results to prevent human error. 3. Using a variety of subjects from different sports, races and genders. 4. Comparing the effects of nicotine users and non-users. 5. Improve validity and other factors that may influence an effect using nicotine.

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IMMERSION OF LOWER BODY PARTS WITH COLD WATER REDUCES PHYSIOLOGICAL RESPONSES AND ENHANCES DISTANCE COVERED RUNNING IN HOT ENVIRONMENT

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Abstract

The purpose of the present study was to examined the effects of a 12-min cold water immersion(CWI) on each of, core temperature (Tc), oral temperature (To), heart rate (HR) and running distance covered performance in the second trial in a hot environment. Ten participant (mean age 30.5±5.54 years ; height 1.84.1±5.10 ; body mass 76.62± 9.48 kg,) completed two testing sessions separated by one week; each trial consisted two bouts of a 30-min running on hot condition (30.90°±1.28°C, 72.6±5.68% relative humidity). The two bouts were separated by either 22 min of seated recovery in the heat (non-CWI) or the same condition with 12-min CWI(mean 15±1°C (5th–17th minute). HR, Tc, To and distance in second bout were recorded throughout the testing sessions. There was a significant incline in performance-trial from Test1 to Test2 using CWI (7010 ± 495.92 m) compared to the change seen non-CWI (6887± 490.42). (Tc) was reduced following non-CWI (37.94 ±1.0ºC) compared with CWI (37.52 ± 0.4 ºC). The total HR during the non-CWI and CWI test was (96.50 ± 14.27pbm) (decline range 84.7 pbm) and (84 ± 9.84 pbm) (decline range 93.5pbm), respectively. (To) no deferent between non-CWI recovery (36.50±.318ºC) ,compared to the change seen CWI (36.50±.405ºC). 12-min cold-water immersion recovery significantly lowered (Tc) and maintained endurance performance during second test session . These data indicate that repeated exercise performance in heat may be improved when a short period of cold-water immersion is applied during the recovery period.

Keywords Cold water immersion. Core temperature. Recovery .

1. INTRODUCTION

The high temperature is one of the most challenging factors that is long-distance runners (endurance sport) are suffering from (Lawrence et al. 1996; Susan. 2005; Darren and Scott. 2006). Thus, running for long distances in a hot weather causes an increment in coetaneous blood flow to get rid of the excessive temperature which is a result of metabolic heat production and the increment of the local temperature. so that the runner could have thermal fatigue, and straining cardiovascular as well, because of the breathing in the blood amount among skin and working muscles including brain, which leads finally to the fatigue.

The Thermal strain happens when the rate of metabolic heat production is higher than the ability of the body's ability to get rid of it (Lawrence et al. 1996; Susan. 2006). The increment of this production while the runner is running in a hot weather which ends up with thermal pressure (Herbert and Terry. 1994; Bodil and Lars.2003; Darren and Scott.2006). From another point of view, under the same conditions or because of dryness, (Nag et al.1998; susan.2005), Arterial hypotension, Low cardiac output, High pulse rate, Increment pulmonary ventilation and low cerebral blood flow (Marino. 2002; Cariget al.2003; Marc et al.2006).

Loosing 2% of the mass body because of sweating might happen because of the running for 60 minutes or more in a hot weather (above 30°C), while the player may reach to that percentage when he runs for 90 minutes or more in a cold weather (5-10 C˚), average temperature (18-22 °C) or warm weather (24-29 °C), (susan.2005), so that this affects the volume of the body fluid inside and outside the cells as well (Maw et al.1998; Stocks et al.2004). On the other hand, the thermal makes the brain activities to be changed, since it is one of the most affected-organs with the thermal strain, (Duffield et al., 2003) and causes failure of the motor cortex which is resembled in decreasing motivation/willful activation of the muscle, so that it is one of the most causes for happening central fatigue (Marino.2002; Bodil and Lars.2003; gabrielle et al.2005; Susan.2005; Marc et al.2005).

The player who is suffering from **thermal strain** and mental status changes in the long-distance running in a hot weather, the immediate rapid cooling by immersing in cold water, and this way is good and it is advised until the anus temperature decreases to(38C˚),(Lawrence et al. 1996; Eranet al.2004; James et al.2005; Darren and Scott.2006), so immersion in the cold water increases blood pressure, to the natural rate, by peripheral vasoconstriction /increasing its resistance (Stocks et al. 2004), which causes the impulse of the cold-blood to the core and cooling it.) On else more, it lessens inflammation of the infected tissues and the hematoma as well (Bailey et al.2007). Therefore, a strategy to reduce core temperature during halftime breaks (15 min) could minimize the reduction in performance that is often observed during the second half. The effectiveness of cold water immersion for decreasing core temperature and increasing the heat storage capacity of individuals during exercise has been quantified.

For example, after 30 min of 14°C torso-only cold water immersion, Marsh and Sleivert .,1999 reported an average decrease in rectal temperature of 0.3°C during a15-min exercise session. Additionally, Kay et all.,1999 observed a significant increase (158 2 30 min of constant-paced cycling following 58 min of 25°C whole-body cold-water immersion, when compared with a control condition.

Despite the promise of using cold-water immersion recovery to improve exercise performance in the heat, controversy exists concerning its effectiveness. For example, Crowe et al.,2007 and Schniepp et al.,2002 reported a decrease in cycling sprint performance after a 15-min whole-body cold-water immersion (14°C) intervention.

However, both of these studies were conducted in non-hyperthermia conditions (≤ 27°C), which do not represent a practical scenario for applying a cold-water immersion intervention. Conversely, Yeargin et al.,2006 showed that 12 min of whole-body cold-water immersion (14°C) after 90 min of running in the heat significantly reduced the time to complete a 2-mile running time trial compared with a control condition.

Also, from the literature review of physical performance in hot environments, I found that previous studies that used the cooling process of the body (either upper body or lower body) were conducted in laboratory. Traditionally, each of forehead, temporal, oral, aural, and axillary oral body sites have been used for body temperature measurement although these methods are not accurate when measuring a real intestinal body temperature during the physical activity. However, it has been suggested by Matthew at et al.,2009 that measuring intestinal temperature is necessary for evaluating a real body temperature.

It seems that using vital sense is one of the most appropriate methods for measuring intestinal body temperature. Importantly, because laboratories do not reflect real conditions of sport competitions, in the present study was conducted in the external environment. The study aim was to investigate the effect of lower body immersion in cold water during the rest period between two sets of 30 min tests, in the hot environment, on the running distance covered, and some of the physiological responses.

2. METHODS

Participant

The study received prior approval from the Marmara University ethics committee, and athlete provided written informed consent to participate after reading a document describing the nature, benefits and possible risks of the study. Ten well-trained male athletes (age: 30.5±5.54 years, height: 184.1± 5.10 cm, weight:76.62± 9.48 kg, Vo2max: 54.1 ± 7.2 ml /kg/min) agreed to participate this study. All participant had been training for at least 5 years and had a weekly training volume that was greater than 5days in a week .

The subjects were required to complete one shuttle run test, and two experimental sessions separated by 4–7 days. The average temperature and humidity of Istanbul were 30.90±1.28C, 72.6±5.68% in august(http://www.meteor.gov.tr). The athletes were not heat acclimated before the first test and they did not perform any intense training in the few days before or between the test.

Shuttle Run Test

Before the experimental trials, maximum oxygen uptake (VO2max) was determined from a progressive intensity and continuous effort shuttle run protocol. The test consisted of continuous running back and forth between two lines 20 meters apart from each other within a given time. The time was shortened every 2 minutes, which therefore increased the running speed. Players had to run until their volitional limit at which they were not able to keep up with the running speed. Additionally, the validity of the test was shown to be high as well (r = 0.92), showing a high correlation between performance in the multistage 20m shuttle run test/beep test and a "true" VO2max measurement with a spirometry (Alemdaroglu,U.et al.2012. Aziz, A. R., H. Y. Frankie and C. T. Kong.2005. Flouris, A. D., G. S. Metsios and Y. Koutedakis.2005)

Core temperature measurement

Core temperature (Tc) was monitored using a Vital Sense telemetric physiological monitoring system (Mini Mitter Co. Inc., Bend, Oregon, USA), which consists of a receiver and a thermistor-based, ingestible jonah core temperature sensor capsule. as reviewed extensively by byrne and lim (2007), the ingestible telemetric temperature sensor represents a valid index of core temperature measurements. The validity of self-calibrated sensors and core body temperature monitoring systems had been shown by McKenzie and Osgood (2004). sensors were activated approximately 5 h before the test and swallowed immediately after activation. By the time of the test session , the sensors would have passed through the stomach and the temperature measurements would not be substantially affected by the ingestion of hot or cold liquids. All the swallowed thermo sensor pills were checked before the test to ensure the device residing in the athletes was transmitting a signal. Signals from the sensor were collected just before the test to record initial core temperature values.

HR Measurement

HR was monitored continuously using a wireless HR monitor (RS800, RS400 Polar, Finland).

Oral Temperature Measurement

Oral temperature (To) was monitored using a (microlith digital clinical Thermo - REF MT 3001) before and after each round of running.

Cold water immersion

During the 12-min cold-water immersion, subjects were submerged in an inflatable water bath, in a seated position to the iliac crest level, wearing only their cycling shorts. Water temperature was maintained at a constant 15±1°C. The water temperature selected for this study (15±1°C) was chosen as it appears as the most commonly used water temperature in previous cold-water immersion studies (lane et all., 2004.yeargin et all., 2006.clements et all., 2002. Mitchell et all., 2002) and is effective at lowering body temperature and is tolerable for most subjects.

Experimental sessions

All athlete swallowed the activated thermo sensor about 5 hour before the test. Approximately 30 min before the start of the test, The physiological and anthropometric variables was measured, wearing only underwear, were weighed to the nearest 50gr using a digital scale. Before and after the two trial one investigator from the research team recorded round, HR and body core temperature. During the two experimental sessions, participant completed 30 min of running in the track that corresponded to 80-85% of Vo2max in an environmental chamber maintained at 30.90 ±1.28°C and 72.6±5.68% relative humidity. The intensity and duration of the constant-pace session were selected to provide an adequate stimulus to increase core temperature . Participant were permitted to warm-up before first session for 20 minute.

After the first time trial, the CWI group were submerged (to the iliac crest) in an inflatable ice bath for a period of 12 min wearing short trousers. The temperature of the water was maintained at 15 ±1°C by adding crushed ice. To isolate the recovery benefits of cold-water immersion, passive sitting occurred before and after the cold-water immersion period. During the control condition, participant were seated for the entire 12 min in the 25±1°C heat chamber. After the 12-min recovery period, we measured the physiological changes from the participant, then repeat the running a second 30 minutes of running in the track that corresponded to 80-85% of Vo2max. After the second trial We have once again to measure variables, compare them with the control group (non-CWI). And two experimental sessions separated by 4–7 days.

Statistical analysis

Values are reported as mean -standard deviation. Statistical significance was accepted as P≤0.05 with a confidence interval of 95%. Pre and post-match variations within the experiment were evaluated with Wilcoxon signed ranks test.

3. RESULTS

Meteorological measurements

The average ambient temperature for the august test was 30.90± 1.28 °C with a relative humidity of 72.6± 5.68%. The CWI and non-CWI test were take place between 12:00 and 14:00 clock. The average temperature and humidity were taken from the website written down. (http://www.meteor.gov.tr).

Performance

There was a significant incline in performance-trial in Test2 more than Test1 by using cold water immersion (CWI) test (7010 ± 495.92 m) compared to the change seen non cold water immersion (non-CWI)test (6887± 490.94) (Fig 1). The total distance covered during the control and CWI test was (6698 ± 625.94m) (range 5600-8000 m) and 6948.5 ± 492.5m (range 6400 –8000 m), respectively. The total distance covered in the first and second halves was 6902 ± 494.00 and 6494 ±757.89m for the control test (non- immersion) and 6887 ± 490.94 and 7010± 495.42 m for the CWI test , respectively.

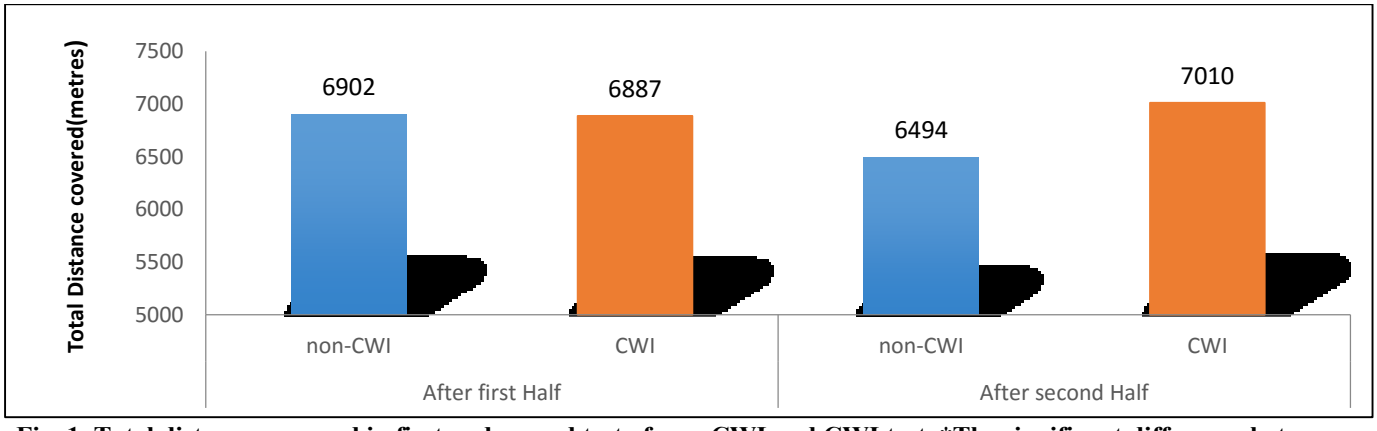

Fig. 1. Total distances covered in first and second test of non-CWI and CWI test. *The significant difference between second halves of CWI test (P≤0.005)

There was no difference in distance covered between the two halves of the non-CWI test, however athlete covered less distance in the second half about 408m of the non-CWI test than they did in the first half (Fig. 1). In the CWI Test, There was no difference in the covered distance between the two halves; athletes covered more distance\average in the second half about 123 m than they did in the first half (Fig. 1) and table(1).

For the CWI it has been noticed that the average covered distance was 516m more than that of the non-CWI

Table (1).Wilcoxon rank test result to clarification statistical differences in total distance covered between first and second test for non-CWI and CWI trial.

Total distance covered	Rank	N	Mean of rank	Sum of rank	z	Sig*
After first and second Half (Non-CWI)	Negative rank	**7**	**5.07**	**35.50**	1.541	.123
	positive rank	**2**	**4.75**	**9.50**		
	Tie	**1**				
	Total	**10**				
After first and second Half (CWI)	Negative rank	**1**	**5.50**	**5.50**	1.466	.143
	positive rank	**6**	**3.75**	**22.50**		
	Tie	**3**				
	Total	**10**				
after first half Non-CWI vs. CWI	Negative rank	**3**	**2.50**	**7.50**	0.921	.357
	positive rank	**1**	**2.50**	**2.50**		
	Tie	**6**				
	Total	**10**				
After second half Non-CWI vs. CWI	Negative rank	**1**	**3.50**	**3.50**	2.261	.024*
	positive rank	**8**	**5.19**	**41.50**		
	Tie	**1**				
	Total	**10**				

p <0,05*

Core temperature measurements

Athletes began the two test with similar body core temperatures as measured after their warm up had been completed(36.87±.380°C) and (36.57±.327°C) for non-CWI and CWI test, respectively. However, there no difference between test in core temperature values in the first half. After first half, core temperatures increase to 39.07± .407° C for non-CWI, and 39.19 ±.432 °C for CWI test was measured, the results showed statistically no significant (P<0.05) differences for non-CWI and CWI, respectively. The CWI group were submerged (to the iliac crest) in an inflatable ice bath for a period of 12 min wearing short trousers. The temperature of the water was maintained at 15 ±1°C by adding crushed ice.

Mean of recovery level after submerged and before start the second trial for core temperatures, in non-CWI test was decrease from 39.07 to37.94 C, (decline range 1.13 °C) . In the CWI test ,mean of recovery level for core temperatures was decrease from 39.19 to 37.52 °C (decline range 1.67 °C). There were statistically significant p <0,05 differences between the two trials after immersion and before second trial.

After the second trial the total core temperatures in the control (non-CWI)test increase from 37.94 to 39.27°C(incline range 1.33°C), in the CWI test increase from 37.52 to 38.56 °C (incline range 1.04 °C) there were statistically significant p <0,05 differences between the two trials after second half (fig.1).

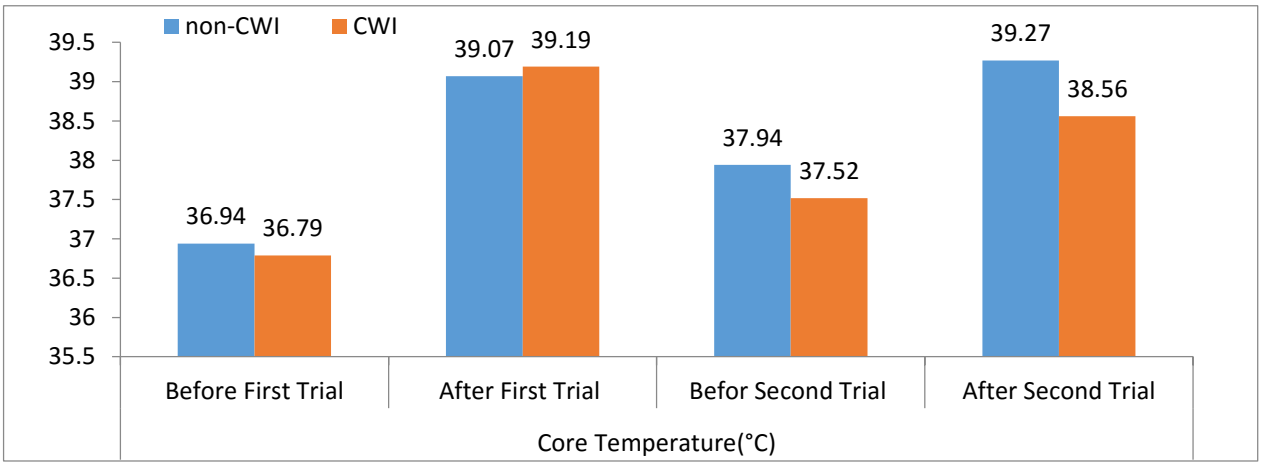

Fig. 2. Core temperature (Tc) before and after first trial and second trial of non-CWI and CWI test. *The significant difference between first and second halves of CWI test (P≤0.005).

Table (2).Wilcoxon rank test result to clarification statistical differences (Tc) between first and second test for non-CWI and CWI trial.

Core temperature (Tc)	Rank	N	Mean of rank	Sum of rank	z	Sig*
Before first Half (Non-CWI vs. CWI)	Negative rank	8	5.00	40.00	1.274	0.203
	Positive rank	2	7.50	15.00		
	Tie	0				
	Total	10				
After first half (Non-CWI vs. CWI)	Negative rank	3	6.83	20.50	.714	0.475
	Positive rank	7	4.93	34.50		
	Tie	0				
	Total	10				
Before second half (Non-CWI vs. CWI)	Negative rank	10	5.50	55.00	2.803	0.005*
	Positive rank	0	.00	.00		
	Tie	0				
	Total	10				
After second half (Non-CWI vs. CWI)	Negative rank	10	5.50	55.00	2.803	0.005*
	Positive rank	0	.00	.00		
	Tie	0				
	Total	10				
Deferens between before and after second half of (Non-CWI vs. CWI)	Negative rank	**8**	**5.25**	**42.00**	1.478	.139
	positive rank	**2**	**6.50**	**13.00**		
	Tie	**0**				
	Total	**10**				

p <0,05*

Oral Temperature

Athlete began the two test with similar body oral temperatures as measured after their warm up had been completed (36.53±.266°C) and (36.59±.264°C) for non-CWI and CWI test, respectively. After first half, oral temperatures increase to 39.23 for non-CWI, and 39.29 for CWI test was measured, the results showed statistically no significant (P<0.05) differences for non-

CWI and CWI, respectively. The CWI group were submerged (to the iliac crest) in an inflatable ice bath for a period of 12 min wearing short trousers. The temperature of the water was maintained at 15 ±1°C by adding crushed ice.

Mean of recovery level after submerged and before start the second trial for core temperatures, in non-CWI test was decrease from 39.23 to 36.50°C, (decline range 2.73 °C) . In the CWI test ,mean of recovery level for core temperatures was decrease from 39.29 °C to 36.50 °C (decline range 2.79°C). there were statistically significant p <0,05 no differences between the two trials after immersion and before second trial.

In both test, oral temperatures fell during the half-time break, and did return to the peak first half level during the second half of the match .

The total oral temperatures after second half, in the non-CWI test increase from 36.5 to 38.96°C (decline range 2.46°C), and CWI test increase from 36.5 to 38.74 (decline range 2.24° C) there were statistically significant p <0,05 no differences between the two trials after second half (fig.3).

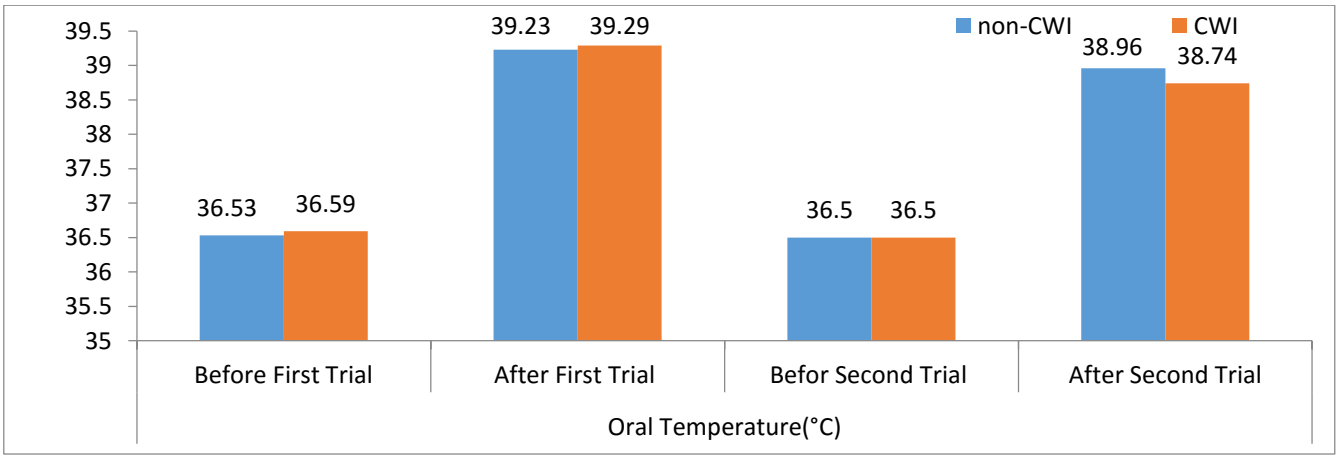

Fig. 3. Oral temperature (To) before and after first trial and second trial of non-CWI and CWI test. *The significant difference between first and second halves of CWI test (P≤0.005).

Table (3).Wilcoxon rank test result to clarification statistical differences (To) between first and second test for non-CWI and CWI trial.

Oral Temperature (To)	Rank	N	lean of rank	ım of rank	z	Sig*
Before first Half Non-CWI vs. CWI	Negative rank	6	3.67	22.00	0.059	.953
	Positive rank	3	7.67	23.00		
	Tie	1				
	Total	10				
After first half Non-CWI vs. CWI	Negative rank	2	8.50	17.00	1.071	.284
	Positive rank	8	4.75	38.00		
	Tie	0				
	Total	10				
Before second half Non-CWI vs. CWI	Negative rank	5	6.30	31.50	.409	.683
	Positive rank	5	4.70	23.50		
	Tie	0				
	Total	10				
After second half Non-CWI vs. CWI	Negative rank	6	3.67	22.00	1.479	.139
	Positive rank	3	7.67	23.00		
	Tie	1				
	Total	10				

ɛferens between Before and after second half of (Non-CWI vs. CWI)	Negative rank	7	5.29	37.00	.968	.333
	positive rank	3	6.00	18.00		
	Tie	0				
	Total	10				

p <0,05*

Heart Rate (HR)

Average HR in the first half of the non- CWI test was higher in both halves (181.2 ± 10.99 pbm), In the CWI test ,athlete mean HR in the first half was (177.50 ± 11.20 bpm), in the second half (177.60±11.14 bpm). The results showed statistically no significant(P<0.05) differences between test in first half. The CWI group were submerged (to the iliac crest) in an inflatable ice bath for a period of 12 min wearing short trousers. The temperature of the water was maintained at 15 ±1°C by adding crushed ice. Mean of recovery level after submerged and before start the second trial for core temperatures, in non-CWI test was decrease from 181.2 pbm to 96.50 pbm , (decline range 84.7 pbm) . In the CWI test ,mean of recovery level for core temperatures was decrease from 177.5pbm to 84 pbm (decline range 93.5pbm). there were statistically significant p <0,05 differences between the two trials after immersion and before second trial. In both test, heart rate fell during the half-time break, and did return to the peak first half level during the second half of the test. There were no statistically significant p <0,05 differences between the two trials in the first and second half. After the second half the total HR in the non-CWI test increase from 96.5 pbm to 180.3 pbm (decline range 83.8 pbm), and CWI test increase from 84 pbm to 177.6 pbm (decline range 93.6 pbm) there were statistically significant p <0,05 no differences between the two trials after second half.

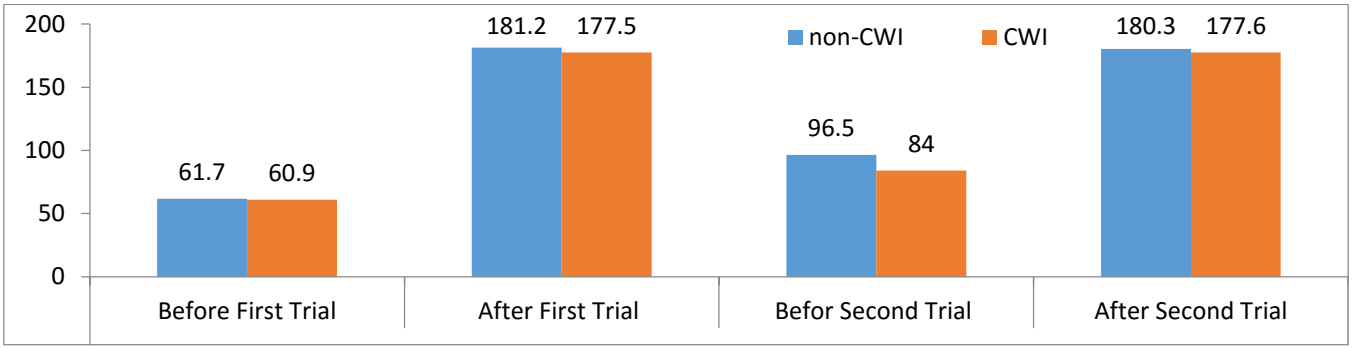

Fig. 4. HR before and after first trial and second trial of non-CWI and CWI test. *The significant difference between first and second halves of CWI test (P≤0.005).

Table (4).Wilcoxon rank test result to clarification statistical differences (HR) between first and second test for non-CWI and CWI trial.

HR(Pbm)	Rank	N	Mean of rank	Sum of rank	z	Sig*
Before first Half Non-CWI vs. CWI	Negative rank	3	4.67	14.00	.000	1.000
	Positive rank	4	3.50	14.00		
	Tie	3				
	Total	10				
After first half Non-CWI vs. CWI	Negative rank	5	5.10	25.50	1.051	.293
	Positive rank	3	3.50	10.50		
	Tie	2				
	Total	10				
Before second half Non-CWI vs. CWI	Negative rank	10	5.50	55.00	2.809	.005*
	Positive rank	0	.00	.00		
	Tie	0				
	Total	10				

After second half Non-CWI vs. CWI	Negative rank	6	5.08	30.50	.949	.342
	Positive rank	3	4.83	14.50		
	Tie	1				
	Total	10				
Deferens between Before and after second half of (Non-CWI vs. CWI)	Negative rank	1	1.00	1.00	2.549	.011*
	Positive rank	8	5.50	44.00		
	Tie	1				
	Total	10				

p <0,05*

4. DISCUSSION

Performance

Athletes covered more distance\average in the second half about 123 m than they did in the first half of the cold water immersion(CWI) test (Fig. 6). For the CWI it has been noticed that the covered distance was 516 m more than that of the non-CWI. From the above mentioned result it can be inferred that Using cold-water immersion recovery to improve exercise performance in the heat. And in our data indicate that 12 min of cold-water immersion during a 22-min recovery session can decrease core temperature and attenuate the decline in high-intensity exercise performance without affecting submaximal economy of motion in hot environmental conditions. And it concerts with the study of Wilcock et al., 2006. cooling techniques in hot conditions aim to rapidly reduce elevated thermoregulatory and cardiovascular strain, alleviating impaired neuromuscular function and facilitating the maintenance of subsequent exercise performance.

Core temperatures (Tc)

The effectiveness of cold water immersion for decreasing core temperature and increasing the heat storage capacity of individuals during exercise has been quantified (Kay D, Taaffe DR, Marino FE .1999) For example, after 30 min of 14°C torso-only cold water immersion, Marsh and Sleiver.,1999, reported an average decrease in rectal temperature of 0.3°C during a 15-min exercise session. Additionally, Kay et al.,1999, observed a significant increase (158(13.1W m2) vs. 84 (8.8 W m)) in heat storage capacity during 30 min of constant-paced cycling following 58 min of 25°C whole-body cold-water immersion, when compared with a control condition.

In the present study, core temperature increased rapidly from first half on both test, and the rate of increase was not apparently different between non-CWI and CWI during the first test . In the second half of the test there was little increase in core temperature in the non-CWI test, furthermore it continued to rise in the CWI test so that mean core temperature was about 0.3°C in the more high heat environment. Even though the Running distance which average covered by the athletes in the CWI test is more than they covered in the non-CWI test, the degree of core body temperature was lower in CWI test.

Oral Temperatures(To)

Evidence suggests that, regardless of whether the assessment is recorded at rest or during periods of changing core temperature, oral temperature is an unsuitable diagnostic tool for determining body temperature because many measures demonstrated differences greater than the predetermined validity threshold of 0.27°C (0.5°F). In addition, the differences were greatest at the highest core temperatures. Oral temperature cannot accurately reflect core body temperature, probably because it is influenced by factors such as ambient air temperature, probe placement, and ingestion of fluids. Any reliance on oral temperature in an emergency, such as exertional heat stroke, might grossly underestimate temperature and delay proper diagnosis and treatment. (Mazerolle et al.,2010.2011). And in our data indicate that because there was no deference's between non-CWI and CWI test. On the other hand the result show differences between CWI test and non-CWI test by using ingestible capsule to measure the internal temperature.

Heart Rate (HR)

If we see the level of increase for each of the first and the second half for both non-immersion and immersion were as follows:

Non- immersion : It rose in the first half from 120 to 189 pbm, at the rate of increase up to 69 pbm, and in the second half it rose from 122 to190C at the rate of increase up to 68pbm. **In cold water Immersion test :** It rose in the first half from 115 to 190 pbm, at the rate of increase up to 75 pbm , and in the second half it rose from 113to 175 pbm, at the rate of increase up to 62pbm. This shows that the immersion in cold water test contributed to the improved performance more than non-immersion test. As a result, it showed a decrease in the heart rate ,which is reflected in the running for a more distance in the second half. This can be explained that the longer distance running in the second half rather than first half of the test. The reduction in HR following CWI

may also be the consequence of a more rapid rise in parasympathetic activity that may or may not be independent of blood redistribution. During the final stages of test 2, during the all-out performance-trial phase, there was no difference in heart rate, although significantly more work was completed during the performance-trial following CWI compared with non- CWI.

5. CONCLUSION

1- 12-min cold-water immersion recovery significantly lowered core temperature with a decrease in total distance covered in the second half of the test, compared to non-CWI.
2- This information is pertinent to athletes, if they do have immediate access to recovery facilities between exercise performance.
3- In present study ,Oral body sites have been used for body temperature measurement although these methods are not accurate when measuring a real intestinal body temperature during the physical activity. However, it has been suggested by Matthew at et al. (2009) that measuring intestinal temperature is necessary for evaluating a real body temperature.

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THE EFFECT OF HIGH INTENSITY TRAINING ON FREE RADICALS' LEVEL USING SOME BIOCHEMICAL INDICATORS SUCH AS GLUTATHIONE & MALONDIALDEHYDE ENZYMES FOR IRAQI NATIONAL TEAM WHEELCHAIR TENNIS PLAYERS

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Abstract

The training process and the followed methods enhanced the athlete's strength to make performance intensity reach more than 100%. In addition, this training process, at the same time, is not free of drawbacks that may be reflected negatively on the athlete's health which may lead to many physiological changes whether at the level of cells or blood through formation of free radicals such as oxygen and hydrogen (…..OH, H, O). These radicals are characterized as being atoms with effectiveness and unstable activity. They search for stability, so they attack the cellular wall and interact with phosphoric fats forming this wall and thus they damage it and then the cell. They may also result in damaging the cell's DNA. As a result, cells and tissues may catch diseases that may start with colds and end with cancer. Therefore, the researcher referred to this destructive effect of free radicals through their high levels over the normal level during practicing wheelchair tennis players the high intensity training units using continuous training method and their reflections on raising the level of glutathione & malondialdehyde enzymes over normal level. The researcher found that high intensity training with continuous method was connected to some negative aspects such as high levels of free radicals. It is known that their rising over normal rates will lead to damages at the cells level and, accordingly, at tissues level. Therefore, the researcher believes that it is necessary to legalize sport training process in terms of intensity, rest and following a diet spontaneous with high intensity training system noting that this diet should include anti-oxidants which reduce activity of the radicals.

Keywords: biochemical indicators, glutathione enzyme, malondialdehyde enzyme, free radicals, high intensity training.

1. INTRODUCTION

Scientific progress played an important role in advancing societies at various fields. The developed countries take responsibility of applying scientific bases and the best ways to improve their societies in various fields. The sports field in these countries had great prestige through their dependence on policies to satisfy their people through the provision of all supplies. These people were pushed forward with achievements that are almost out of mental visualization. This development did not happen by accident, but through continuous experiment, which is not free of mistakes but in the end the result was the prestigious success of these countries. However, these methods were not adopted in Arab countries, including Iraq and all that is known about our countries as the countries of marketing what was done in developed countries and, for example, using high intensity training whether at the special preparation stage or at competitions stage. It is needed to know many aspects to perform such type of training for the purpose for which it was set, or there may be negative factors related to this type of training that should be avoided during application of this training method. These were the reasons that led the researcher conduct this study to determine the negative effect of high intensity training through raising the level of free radicals related to high intensity. Therefore, the researcher performed tests to some enzymes such as glutathione & malondialdehyde enzymes through which he can detect the level of free radicals. The researcher conducted these tests during the tennis national team's performance of training units at the special preparation stage to detect the rise in the level of these radicals at the end of the training unit compared with the beginning of this unit through which he found rise in percentage of these radicals in great percentages at the end of the unit compared with its beginning.

Problem of the Study

The training process took different direction from normal aspects as we can see that there are some training units that reached high level of 100% of performance intensity of the athlete's ability. Sometimes, they exceed physiological abilities of athletic individuals which make the training process not free of mistakes which are reflected negatively on the athlete's health and achievement level. This can be seen during high intensity sport training using continuous method as it leads to a lot of physiological changes such as moving a great percentage of blood to the working muscles during efforts and return back to normal

functioning after effort to internal organs. These organs include lever, kidneys and others. During the return to these organs, free radicals will be formed such as oxygen OH, H, O. As known, these free radicals have unstable effectiveness and activity and search for a state of stability. These radicals attack many organs such as cellular walls and interact with phosphoric fats that form this wall. Accordingly, this wall is damaged and then the cell and body as a whole with unexpected performance of athletes in future. Here, the significance of this study is clear in detecting the destructive effect of these free radicals through their rising levels over normal level in addition to scientific and applied importance of this study due to lack of studies tackling such type of problems.

Objectives of the Study

1- Defining the level of free radicals with significance of some biochemical indicators such as glutathione & malondialdehyde enzymes in blood for players of Iraqi wheelchair tennis national team.
2- Defining the effect of high intensity training on the level of free radicals with significance of some biochemical indicators such as glutathione & malondialdehyde enzymes in blood for players of Iraqi wheelchair tennis national team.

2. HYPOTHESIS OF THE STUDY:

There are statistically significant differences between findings of pre- and post-tests for the sake of post-test related to high levels of glutathione & malondialdehyde enzymes in blood for players of Iraqi wheelchair tennis national team.

3. METHODOLOGY:

The researcher used the empirical method in solving the problem of the study as it is the best method in solving such problem.

Sample of the Study:

The sample of study was selected purposively from players of Iraqi wheelchair tennis national team (8 male players).

Biochemical Tests:

Blood Separation Tests

This test aims to separate serum from cells.

Tools and appliances: (centrifuge) device, tube, bandage, sterilization and needle cc5.

Describing performance: the researcher supervised the process of blood extraction at the beginning and ending of the training unit from the position of setting on wheelchairs of the disabled by test officials. A quantity of blood (cc5) was extracted through veins.

Degree counting: separating the serum from cells.

Test of Measuring Glutathione Enzyme (Moore, K. & Roberts: 1998, 69 – 71) GsH

The aim of the test: measuring the level of glutathione enzyme GsH in blood (serum)

Appliances and tools: Spectrophotometer (uv – visblespektro-photometer) to measure glutathione enzyme in blood, made in America.

4. PERFORMANCE DESCRIPTION:

After blood is separated in (centrifuge) device, the serum is treated with an amount of 20 micro-liter with chemical materials related to the test: 20 mcro-liter of (nitrobenzoi acid 2), 5 – 5 dithiobis in addition to phosphate buffer solution with amount of 1000 micro-liter to be put in the uv – visblespektro-photometer. The interaction was put inside a glass bottle with a capacity of cc 5 and in another glass bottle we find chemical materials that were normally put together before that. After that, both bottles were put in the appliance as it works on multiple stages. The first stage is operating the device * (see annex 2) and adjust the device on suitable wave length to measure glutathione enzyme (412) nanometer. The device releases the wave length through emitting faint lighting with wave length of (550 nanometer). This wave length passes by what is called (Monochro Motor or Filter) through which we can control the positive length to measure glutathione enzyme. There are two mirrors that reflect the selected wave length by device operator. Next, these mirrors reflect the wave length on bottles in the device and then readings are reflected through two mirrors after each bottle reaching the detector of readings to give us the needed readings.

Counting the degree: what the device shows are indicators of glutathione level measured by mole / L of blood

Note: * normal rate of glutathione is M 0.15-0.1

Test of Measuring Malondialdehyde Enzyme MDA in Blood (Moore, K. & Roberts: 1998, 69 – 71)

The aim of this test is to measure malondialdehyde MDA enzyme in blood

Appliances and tools: Spectrophotometer (uv – visblespektro-photometer) to measure malondialdehyde MDA enzyme in blood.

Water bath device is used to increase interaction temperature 60 – 70 degrees C.

Performance Description:

After blood is separated in (centrifuge) device, the serum is treated with an amount of 500 micro-liter with chemical material (Trichloro acetic acid) in amount of (7.5 gm) and adding the Thio barrbituric acid TBA with amount of 0.375 gm and then to be put in the water bath device to heat the interaction and reach temperature between 60 and 70 degrees C. After that, a sample is put in the uv – visblespektro-photometer. The interaction was put inside a glass bottle with and the previously mentioned chemical materials in another glass bottle. Both bottles were put in the appliance as the operator adjusts the device on suitable wave length to measure malondialdehyde MDA enzyme (535) nanometer. The device adjusts the wave length through emitting faint lighting with wave length of (550 nanometer). This wave length passes by what is called (Monochro Motor or Filter) through which we can control the positive length to measure malondialdehyde MDA enzyme. There are two mirrors that reflect the selected wave length by device operator. Next, these mirrors reflect the wave length on bottles in the device and then readings are reflected through two mirrors after each bottle reaching the detector of readings to give us the needed readings.

Counting the degree: what the device shows are indicators of malondialdehyde MDA level measured by micromole / L of blood

Note: * normal rate of malondialdehyde MDA is 15-5 micromole / L.

Field Procedures of the Study

The researcher carried out the tests under study during the stage of special preparation. Tests were carried out during the performance of Iraqi national team of wheelchair tennis with a high intensity training unit using continuous method. The researcher did not interfere with items of training and intensity, but his role was restricted to follow-up and watch as the high intensity training is determined through the reflected beats of players ranging between 180 and 190 bp/m. Note that the researcher conducted pre-tests at the beginning of the training unit before effort and post-tests at the end of the training unit.

5. DISCUSSION & ANALYSIS OF FINDINGS:

Table (1): Arithmetic means and standard deviations of glutathione & malondialdehyde enzymes in pre-test

Serial	Variables	Mean	S.D
1	Glutathione	0.0947	0.05732
2	Malondialdehyde	10.9678	3.08234

Through the above table showing arithmetic means and standard deviations under study, the Glutathione enzyme achieved a mean of 0.0947 and a standard deviation of 0.05732, while the mean of Malondialdehyde at pre-test was 10.9678 and a standard deviation of 3.08234.

Analysis of Post-Tests Findings:

Table (2): Arithmetic means and standard deviations of glutathione & malondialdehyde enzymes in post-test

Serial	Variables	Mean	S.D
1	Glutathione	0.3500	0.12767
2	Malondialdehyde	26.4078	4.70338

Through the above table showing arithmetic means and standard deviations under study, the Glutathione enzyme achieved a mean of 0.3500 and a standard deviation of 0.12767, while the mean of Malondialdehyde at pre-test was 26.4078 and a standard deviation of 4.70338.

Findings of Pre- and Post-tests of Variables of the Study:

Table (3): Difference of means, standard deviations and T-counted value of glutathione & malondialdehyde enzymes in pre- and post-tests:

Serial	Variables	Means difference	S.D difference	T Counted Value	T Tabulated Value	Difference
1	Glutathione Pre-Post	0.255	0.158	7.834	2.36	Significant
2	Malondialdehyde Pre-post	15.440	5.147	8.998		Significant

The above table shows difference of arithmetic means and standard deviations between pre and post-tests of the variables under study as well as the T counted value between results of tests of variables under study. It is found that the differences between

means were 0.255, while differences in standard deviations were 0.158 of glutathione enzyme in addition to the T counted value between results of pre- and post-tests were 4.834.

As for malondialdehyde enzymes, differences between means were 15.440, while differences in standard deviations were 5.147 in addition to the T counted value between results of pre- and post-tests were 8.998. the table also shows that differences between results of pre- and post-tests were both significant for the sake of post-tests.

6. DISCUSSING RESULTS

Through the above tables which show that differences are significant, they achieve the hypothesis of the study that there are significant differences. This result asserts the scientific fact that there is a direct relation between intensity and increasing the level of free radicals. Yet, the research shows the amount of collapse processes due to free radicals that were evidenced through high percentage of glutathione & malondialdehyde enzymes in blood. They showed great increases compared with normal level of both enzymes. The researcher attributes this to the fact that the increase of enzymes is normal because of raising training load intensity to the maximum level as it occurred due to physiological processes controlled by the nervous system. This is done through directing blood to functioning muscles and reducing it in some internal organs such as kidneys and others to ensure directing it towards functioning muscles and then returning blood to organs from which it was absent. As a result, free radicals are formed and they increase with the increase of intensity and period of physical effort. The researcher found that the increase in free radicals is a negative condition reflecting the inconsistency between the training program: (external load) with physiological changes: (internal load). There must be adaptations which cannot be reached only when there is a gradation in training courses. The increase in free radicals percentage may be due to inconsistency of the whole course with the level of sample. Therefore, there was an increase in radicals' percentage that might have been used while using legalized sport training which is against what was mentioned by Abo Elela Abdelfattah (Abo Elela Abdelfattah: 1996: 77) and (Kostaka et al: 1998, 7) as they said that: "moderate and regular training or short-term training affect the increase of antioxidant enzymes with reduction of malondialdehyde rates. In addition, Saad Kamal and Ibrahim Yehia: 2005, 23 said that: "With the increase in the training status of the player, the composition of antioxidants in the body may be often enough to prevent destructive effect for the releasing radical oxygen atoms and then the antioxidants may be a few at the beginning of training seasons, and increase in the end". In addition, the researcher attributes that the reason for high increase in free radicals may not be attributed to the training course unit, but to the diet followed by the player as he may not resort to eating food containing antioxidants, which should have privacy and agree with the training course due to the stability of the effect of food on the free radicals levels.

7. CONCLUSIONS:

1- The increase in free radicals rate in body is reflected through levels of glutathione & malondialdehyde enzymes.
2- Predicting great collapse processes in body is done through high levels of free radicals in body.
3- The followed course by the sample of the study is inconsistent with the sample and the reason may not be due to the course as there may be inconsistency by the sample of the study with the course. This was reflected on the increase of free radicals levels as a result of adaptations in internal systems.

8. RECOMMENDATIONS

There should be gradation in training course without moving from a stage to another unless after making biochemical tests such as glutathione & malondialdehyde enzymes.

1- Adoption of a diet that is consistent with the training course for each stage of training based on the followed intensity.
2- It is necessary to educate players with having foods containing antioxidants to reduce the destructive effect of free radicals.
3- Results of the current study should be approved with conduction of comparative researches between other events to determine the level of free radicals and avoid their negative effects.

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THE EFFECT OF USING COORDINATION ABILITIES PROGRAM ON SOME PHYSICAL & SKILL VARIABLES IN GYMNASTICS FOR PHYSICAL EDUCATION DEPARTMENT STUDENTS AT PALESTINE TECHNICAL UNIVERSITY

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Abstract

The study aims to determine the effect of developing coordination abilities on some physical and skill variables for students of physical education department. To achieve this aim, the study was applied on a purposive sample of physical education students (40 students) enrolled in gymnastics. The researcher used the empirical method. After application of the empirical program on members of the empirical sample and ordinary program on members of the control group, it was found that the proposed training program for coordination abilities applied on the empirical group had a positive and significant effect on developing physical abilities which had a positive and significant effect on enhancing the level of skill performance. Accordingly, the researchers recommend that it is necessary to develop coordination abilities for their importance in enhancing special physical characteristics which are effective in enhancing technical performance.

Keywords: coordination abilities, gymnastics

1. INTRODUCTION

Coordination abilities have special significance as they are related to all physical and motor abilities in addition to close relation with motor performance. They give the individual the power of motor flexibility, the ability to relax, correct feeling of performing directions and distances. All of these are necessary factors for sport performance regardless of the type of sport activity.

Momtaz, 2010 refers that coordination is one of the physical abilities which, once acquired by the athlete, provide him with motor abilities that are the sum of adding and combining various components of fitness. Any athlete cannot perform the required skills unless they own consistence functioning on one hand, between the nervous system and the working muscles on the other.

Writer, 2004 found that in various sport types we can distinguish seven coordinating capacities that, in total, comprise conditions to all types of sport with ach ability has its distinct role and significance for each type of sports. From reviewing education literature, these abilities are:

1- The ability of position estimation (the ability of time and place orientation): it is the ability of controlling body movement in time and place and realizing body position and changes in terms of the playground, movement, dimensions of playground, lines of playground and the space used by the player in movement.
2- The ability of motor connection and coordination. This connection is whether between partial movements forming in total a movement that needs coordination due to its various elements, among partial movements forming in total a motor behavior in which the body is involved or among consecutive processes forming motor combinations.
3- The ability to exert suitable effort (the ability of accurate distinction): it is the ability to reach high accuracy and economy in adjusting body movements within stages of complete movement mechanism. It focuses on aware accuracy in distinguishing differences exerted at all movement stages in time and place, between what is actually performed by the player and his perception of movement. This ability is an important condition to master movements. Therefore, it is less dangerous at the learning stage and more significant in skill mastery stage to accurate and detailed limit.
4- The ability to keep composure: the athlete's ability to keep body at a certain position and restore this position in case of deviating from it.
5- Rhythmic ability (timing & rhythm): it is the ability to realize features of change in movement dynamics and the ability to perform such change during implementation of motor behaviors. It is related to the ability to feel the given rhythm from outside such as the music band, simple sight or hearing support, his consistency during performing movements and the ability to achieve self-rhythm in the player's imagination.
6- The ability of quick response: it is the ability to start in a correct movement or a high speed behavior in the shortest time possible in respond to a signal or an alert that may be audio, visual or other alerts. Response often comes with maximum speed.
7- The ability of adaptation: it is the ability to change the sequence of motor behavior or adjusting it during implementation to suit changes in situations, circumstances that can be directly felt, expected in moments previously or the ability to follow-up the application of movements sequence of motor behavior but in another way.

Since gymnastics requires a high level of coordination abilities to perform motor skills with high flexibility, as all body movements are performed based on all parts of the body, the player has to possess the coordination ability. Through the work of the current study's researchers as demonstrators of gymnastics course, they noticed that there is a weakness in the level of performing motor skills as a result of weak training of students in coordination abilities. Therefore, the researchers selected this study to determine the significance of training using coordination abilities on developing skill and physical levels of students.

The significance of this study lies in that coordination abilities training may play an important role in developing a player's skill level considering that a student who lacks a certain aspect of these coordination abilities may find a real difficulty in reaching performance mechanism as well as lacking the ability to balance movements and their outcomes including skills with high levels of performance difficulty. In addition, the training program may play an important role in developing the level of skill and physical abilities of students, increasing the interest in coordination abilities being among factors which help to achieve and reach higher levels with other factors.

Definitions of Terms:

Coordination Abilities:: They are general motor and psychological conditions that enable the athlete to control motor performance. They include: (the ability to estimate position, the ability of motor connection, the ability to exert suitable effort, the ability of balance, the ability to use consistent motor rhythm, the ability of quick response and the ability to adapt to changing circumstances).

Objectives of the Study:

The study seeks to achieve the following goals:

1- To determine the effect of the proposed training program of coordination abilities on some skill and physical variables of members of the empirical group.
2- To determine the effect of the traditional program on some skill and physical variables of members of the control group.
3- To determine differences between members of both empirical and control groups in some skill and physical variables on post-test.

2. HYPOTHESES OF THE STUDY:

1- There are statistically significant differences between pre- and post measures for both the control and empirical group in measurements of the selected physical tests.
2- There are statistically significant differences between pre- and post measures for both the control and empirical group at the technical performance level of motor skills.
3- There are statistically significant differences in the post measures for both the control and empirical group for the sake of the empirical group.

Procedures of the Study

3. METHODOLOGY:

The researchers used the empirical method.

Population of the Study:

The population of the study included students of Physical Education Department at Palestine Technical University / Khadouri.

Sample of the Study:

The sample of the study was selected from students of Physical Education Department at Palestine Technical University in purposive manner for the following reasons:

1. Easy to fund members of the sample at times dedicated for training.
2. Close age levels among students of the sample.

The sample consisted of (40) students. The researchers eliminated sick, injured, failed students in the course, students who exceeded the allowed percentage of absence (2 students) and students who participated in scientific trials of tests (16 students). In the light of remaining number, the researcher divided the sample randomly into:

1- A sample of (10) was students selected as control group subject to traditional program of training on motor skills on the parallel device.
2- A sample of (10) was students selected as empirical group subject to traditional program of training on motor skills on the parallel device.

Physical Characteristics Test:

The researchers surveyed the views of (6) experts in this field. Annex (1) contains names of experts.

- Test of pulling on the horizontal bar.
- Test of trunks bending from lying.
- Test of raising trunks from prostration.
- Vertical jumping test.
- Test of trunks bending forward from sitting.

4. DISCUSSION OF RESULTS:

First: results of first and second hypotheses say that there are statistically significant differences between pre- and post measures for both the control and empirical group in the selected physical abilities and technical performance level tests on devices under study.

Table (4) Differences between pre and post-tests for the empirical group in physical abilities and technical performance level tests

Statistics / Tests	Pre-test		Post-test		T Value	Improvement Percentage
	Mean	S.D±	Mean	S.D±		
Physical Abilities Tests						
Pull on horizontal bar	5.200	1.135	8.700	1.330	21.122	61.538
Raising trunks from prostration	8.800	0.632	14.200	1.229	17.676	61.363
Bending trunks from lying	9.800	0.632	14.400	0.843	13.532	46.938
Vertical jumping test	52.100	1.663	60.000	1.154	19.416	15.163
Bending trunks forward with long sitting	19.400	1.505	24.100	1.197	14.030	24.226
Skill Performance Tests						
Ground movements device	1.750	0.424	7.400	0.394	23.911	322.857
Jumping table device	1.850	0.337	6.900	0.316	32.118	272.972
The parallels device	1.850	0.241	7.000	0.333	48.258	278.387
The ring	1.650	0.241	7.400	0.316	37.421	348.484

Table (4) shows differences between pre- and post-tests in physical abilities test of the empirical group subject to the proposed training program achieved essential advance at level 0.05 in all physical abilities tests applied during the period of the study. The improvement percentage was (15.163, 61.538%). The researchers attribute this advance to the nature and contents of the proposed training program in addition to the training method used in this group. The researchers also attribute the advance in physical abilities level to the used coordination training as it helped raise efficiency of the nervous system and developed connection between sensory and motor nerves. In addition, table (4), which is about pre and post-tests in evaluating skill performance of the devices under study for the empirical group showed that there was an essential progress at level 0.05 in evaluation degrees of skill performance level during trial period. Improvement percentage of skill performance was (272.972, 384.484%). The researchers attribute this improvement to the use of coordination training to enable students to direct their movements efficiently which was reflected on improving the performance of skills on gymnastics devices under study.

This agrees with Ibrahim (2014), Al Khadour (2011) abd Abo Beshara (2010) as they found that there was a significant positive effect for the proposed training program on physical and skill variables for members of the empirical group. Both researchers agree with Adbelmonem (2007) who said that coordination is one of the motor physical abilities which were important in the individual's life in general and in practicing sport activities, especially those in which motor performance requires the use of more than one organ of the body in more than one direction at the same time. Coordination depends on correct connection and integration between muscular and nervous systems to achieve optimal performance of movements, especially complex ones.

The researchers also found that the proposed coordination training developed technical aspects which is due to alerting sensory receptors in muscles and, in turn, improve motor sensing. In addition, similar skill training with technical performance works to

achieve balance between (excision and inhibition) related to nervous activity which leads to make players quickly enter a stage of mastery of the skill.

Table (5) Differences between pre and post-tests for the empirical group in physical abilities and technical performance level tests

Statistics / Tests	Pre-test		Post-test		T Value	Improvement Percentage
	Mean	S.D±	Mean	S.D±		
Physical Abilities Tests						
Pull on horizontal bar	4.900	0.737	6.300	1.059	6.332	28.571
Raising trunks from prostration	8.700	0.674	9.900	0.737	6.000	13.793
Bending trunks from lying	9.600	0.516	10.300	0.483	4.280	7.291
Vertical jumping test	52.200	1.475	55.900	1.197	14.212	7.088
Bending trunks forward with long sitting	19.700	2.002	21.100	2.024	8.573	7.106
Skill Performance Tests						
Ground movements device	1.650	0.579	5.00	0.707	31.391	203.030
Jumping table device	1.800	0.349	4.750	0.634	18.762	163.888
The parallels device	1.800	0.258	4.850	0.474	26.143	169.444
The ring	1.700	0.259	5.000	0.471	29.850	194.117

Table (5) shows differences between pre- and post-tests in physical abilities test of the control group subject to the proposed training program achieved advance at level 0.05 in all physical abilities tests applied during the period of the study. The improvement percentage was (28571, 7.08%). The researchers attribute this advance to the nature and contents of the proposed training program in addition to the training method used in this group in addition to regular training. The researchers also found that gymnastics training and movements tackle various moves for body organs at the same time which leads to develop the student's physical abilities. In addition, table (5), which is about pre and post-tests in evaluating skill performance of the devices under study for the control group subject to the traditional program (studying program) showed that there were essential differences at level 0.05 of skill performance level during trial period. Improvement percentage of skill performance was (203.030, 163.888%). The researchers attribute this improvement to the nature and contents of the studying program to which the control group was subject.

Second: the third hypothesis (There are statistically significant differences in the post measures for both the control and empirical group for the sake of the empirical group) results

Table (6) Differences between empirical and control group in physical abilities and skill performance tests

Statistics / Tests	Empirical Group		Control Group		T Value
	Mean	S.D±	Mean	S.D±	
Physical Abilities Tests					
Pull on horizontal bar	8.700	1.330	6.300	1.059	4.448
Raising trunks from prostration	14.200	1.229	9.900	0.737	9.484
Bending trunks from lying	14.400	0.843	10.300	0.483	13.314
Vertical jumping test	60.000	1.154	55.900	1.197	7.759
Bending trunks forward with long sitting	24.100	1.197	21.100	2.024	4.033

Skill Performance Tests					
Ground movements device	7.400	0.394	5.00	0.707	9.374
Jumping table device	6.900	0.316	4.750	0.634	9.588
The parallels device	7.000	0.333	4.850	0.474	11.727
The ring	7.400	0.316	5.000	0.471	13.370

Table (6) is about differences between empirical and control group in post-test in physical abilities and skill performance tests for the devices under study as it showed that there was an essential advance for the empirical group at level 0.05 at all physical abilities and skill performance tests. The researchers found that this was because the empirical group implemented the proposed training program and planned based on scientific bases following modern scientific principles of sport training in improving physical abilities and motor skills. In addition, the proposed coordination training considered all types of physical abilities related to devices under study which played an important and essential role in improving skill performance level of the skill under study.

This agrees with Minlozoircoa et al (2005), Ibrahim (2014), Al Khadour (2011) and Abo Beshara (2010) who found that coordination abilities play a positive role in improving physical abilities which have a positive effect on skill performance level.

The researchers found that the proposed coordination training led to improve physical abilities related to the skill under study. This led to increase the ability to control systems of the body and economize effort with coordination among movements of the body. This, in turn, also led to develop motor paths of skill performance and decrease learning period in order to reach good performance level at the least possible time period. It was also found that defining physical abilities related to the skill, setting proposed physical training with various use of muscular work methods led to positive results at the physical abilities level.

5. CONCLUSIONS:

Based on findings related to objectives of the study, in the light of the used methodology and at limits of the sample and its characteristics, the researcher concluded the following:

1- The proposed training program using coordination training directed to improve physical abilities related to skills on gymnastics devices under study on the empirical group had a positive effect in developing physical abilities related to skill performance level.
2- The proposed training program using coordination training was effective in improving skill performance level on devices under study.
3- The training program related to Department of Physical Education at Palestine Technical University on the control group led to relative improvement in physical abilities related to skill performance level on gymnastics devices under study.

6. RECOMMENDATIONS:

At the limits and procedures of the study, the researcher recommends the following:

1- It is necessary to benefit from the proposed training program by workers in teaching and training gymnastics to improve physical abilities using coordination training for their importance in improving technical performance of skills on gymnastics devices.
2- It is necessary to conduct similar studies to determine the effect of coordination training of gymnastics skills on the other devices for the purpose of raising the level of performance in gymnastics.

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THE PREVALENCE OF METABOLIC SYNDROME COMPARED TO PHYSICAL ACTIVITY IN A POPULATION OF SALE, A NORTH WEST CITY OF MOROCCO

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Abstract

Developing countries are undergoing an epidemiologic transition accompanied by increasing burden of cardiovascular disease (CVD) linked to urbanization and lifestyle modifications.Metabolic syndrome is a cluster of CVD risk factors where the lack of physical activity strongly favorite many associated factors of metabolic syndrome. The aim of this study was to determine the prevalence of metabolic syndrome compared to physical activity in a population of Sale, Morocco.

Keywords: Cardiovascular disease, metabolic syndrome, physical activity.

1. INTRODUCTION

The progressive accumulation of the body weight leading to obesity results, in a schematic but an inevitable way to circumvent, from the long-term imbalance sheet of energy. This situation is initially the consequence of modifications of the most immediate mediators of the assessment of energy who are the dietary habits and the profiles of physical-activity (WHO, 2000). This situation of positive energy balance sheet reflects an imbalanced energy provisions compared with the expense of energy. This situation is the consequence of modifications of the most immediate mediators of the balance sheet of energy, which are food habits and physical activity (WHO, 2000). Metabolic syndrome is an emerging entity that brings together in the same individual several metabolic abnormalities that predispose each at cardiovascular risk; it associates central obesity, hypertriglyceridemia, low HDL cholesterol (cholesterol and high density lipoprotein), hypertension, glucose intolerance. It triples the risk of cardiovascular disease and the risk of new type 2 diabetes (1) Decreased physical activity is likely to be an important etiological factor. Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. Physical inactivity (lack of physical activity) has been identified as the fourth leading risk factor for global mortality (6% of deaths globally). Moreover, physical inactivity is estimated to be the main cause for approximately 21–25% of breast and colon cancers, 27% of diabetes and approximately 30% of ischaemic heart disease burden. Regular and adequate levels of physical activity in adults :reduce the risk of hypertension, coronary heart disease, stroke, diabetes, breast and colon cancer, depression and the risk of falls; improve bone and functional health; and are a key determinant of energy expenditure, and thus fundamental to energy balance and weight control (2).

The only practice of moderate physical activity intensity was already associated with a significant reduction in the risk of type 2 diabetes (3).

2. PROBLEM OF THE STUDY

In Morocco, the practice of physical activity has a regression because only 50% of youth reported physical activity (4); even more the complications of diabetes and cardiovascular diseases caused in 2012 a total mortality rate of 46% (5). Morocco, therefore, like other developing countries is undergoing the consequences of a deviation from the Mediterranean dietary pattern (6).

There are no enough studies in this field and especially that combines between physical activity and metabolic syndrome in Morocco.

Objective of the Study:

The objective of this study was to determine the prevalence of metabolic syndrome compared to physical activity in a population of Sale, Morocco.

3. METHODOLOGY

This is a descriptive cross-sectional study, conducted from July to September 2015 taking place in the city of SALE North west of MOROCCO. A total of 300 subjects participated in the study which 46.7 % male and 53.3 % female. The choice of the sample was made by chance.

Data collection was done using a questionnaire developed and validated locally; including social demographic data, with the measures of anthropometric parameters, Weight was measured using an electronic scale (variation 600g). The size was measured by the measuring board. Waist circumference was measured at the navel. The Blood pressure was recorded in a sitting position after 15 minute of rest, at two intervals of 5 minutes. These measurements were performed with a standard mercury sphygmomanometer on the right arm, and the average of the two measures was recorded used for comparison.

To determine the physical activity we used the IPAQ questionnaire short form (the International Physical Activity Questionnaire). The purpose of the International Physical Activity Questionnaires (IPAQ) is to provide a set of well-developed instruments that can be used internationally to obtain comparable estimates of physical activity. There are two versions of the questionnaire. The short version is suitable for use in national and regional surveillance systems and the long version provide more detailed information often required in research work or for evaluation purposes.(7)

A venous blood sample was taken from each subject while sitting from 7:00 to pm 9:00 after 12-14 hours of fasting. All the blood test was measured by Hitachi biochemistry of the PLC 904 using enzymatic methods, all these acts were performed in the laboratory of medical analysis of prefectural hospital of SALE. The diagnosis of metabolic syndrome was selected according to the National definition Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) (National Institutes of Health. Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (8), which requires the combination of at least three of the following five criteria: waist circumference in women ≥ 88 cm in men ≥ 102 cm, Hypertriglyceridemia ≥ 1.5 g / l, HDL cholesterol < 0.50 g / L in women and < 0.40 g / l in men, blood pressure ≥ 130/85 mmHg, fasting glucose ≥ 1.1 g / l (or medications) .With explorations other biological parameters such as uric acid, creatinemy, urea, CRP .

All statistical analyzes were performed using SPSS software, Quantitative variables were described using mean, standard deviation (SD) and limits. Categorical variables were described using proportions and percentages. For the comparison of groups, we used the $\chi 2$ test for frequencies and Student's test for means. The confidence interval was adopted $p < 0.05$.

4. RESULTS

In total ,300 subjects participated in the study which 46.7 % male and 53.3 % female, a sex ratio M / F 0.87 Of these subjects 56 % were in urban areas and 44 % in rural areas, the average age was 31.64 years (standard deviation: 12.47, range: 18-65). Table 1

Table 1: Characteristics of the studied population

Characteristics	**Participants (n = 300)** **Nbre (%)**
Median age (years)	31.63 (SD=12.47)
Sexe Female Male	 160 (53.3) 140 (46.7)
Place of residence Urban Rural	 168 (56) 132(44)
Study level Illiterate Primary Secondary Superior	 40(13.3) 68(22.7) 152(50.7) 40(13.3)
Marital status Single Marry Divorce Widow	 168(56) 124(41.3) 7(2.3) 1(0.3)

BMI	
< 25	141(47)
≥ 25 (overweight)	120(40)
≥ 30 (obesity)	39(13)

BMI: Body mass index; SD= standard deviation

Table 2: Results of comparative data in both groups with and without metabolic syndrome

Parameter	**Group1 without MS (n=274)**	**Group 2 with MS (n=26)**	**p**
Age (years)	31	40.6	< 0.05
Weight (kg)	70	90.4	< 0.05
Height (m)	1.68	1.70	NS
Waist measurement (cm)	69	95.5	< 0.05
Systolic blood pressur(mmHg)	12.2	14.71	< 0.05
diastolic blood-pressure (mmHg)	7	7.7	<0.05
BMI (kg/m²)	24.4	31	<0.05
Cholesterol T (g/l)	1.6	1.80	<0.05
HDL (g/l)	0.62	0.40	<0.05
LDL (g/l)	0.78	1.13	<0.05
TG (g/l)	1.24	1.68	<0.05
Glycemia (g/l)	0.99	1.85	<0.05
uraemia (g/l)	0.30	0.31	NS
Creatinemy (mg/l)	9.08	9.62	NS
Uricemy (mg/l)	45	74	<0.05
CRP (mg/l)	3	18	<0.05

BMI: Body mass index; HDL-chol = high-density lipoprotein cholesterol; LDL-chol = low-density lipoprotein cholesterol;TG: Triglycerides; CRP: c protein reactive. NS: no significant difference**.**

We did a cross between the metabolic syndrome with age. There was a statistically significant difference between age (classified as ≥ 40 and < 40 years) of the participants with metabolic syndrome [mean 40.6 (SD 13.16) years] and participants without metabolic syndrome [mean = 30.77 (SD 12.05) years] (P < 0.05).

By comparing group 2 (metabolic syndrome) in group 1 (without metabolic syndrome) , we found a significant difference in the HTG , hypo- HDL and TT , age, weight , BMI, T Cholesterol , HDL C , LDL -C , uric acid , CRP, blood pressure , but not for blood pressure and blood sugar .We noted no statistically significant difference , sex, uraemia or Creatinemy . The results of the comparison between the two groups are reported in Table 2.

Test Chi - square was conducted to examine each of the four criteria of ATP - III in patients with metabolic syndrome.

Metabolic syndrome:

Twenty-six of the participants (8.6%) had a metabolic syndrome: 15 women (57.7%) and 11 men (42.3%). The omnipresent anomaly was the hyperglycemia (HFBS) found at 100% of them, followed by hypertriglyceridemia (HTG) in 87% of the cases and arterial hypertension (HBP) in 77%. A Low-HDL was found in 73 % of the cases; a high waist measurement (HWC) was found only in 65% of the cases (Figure 1).

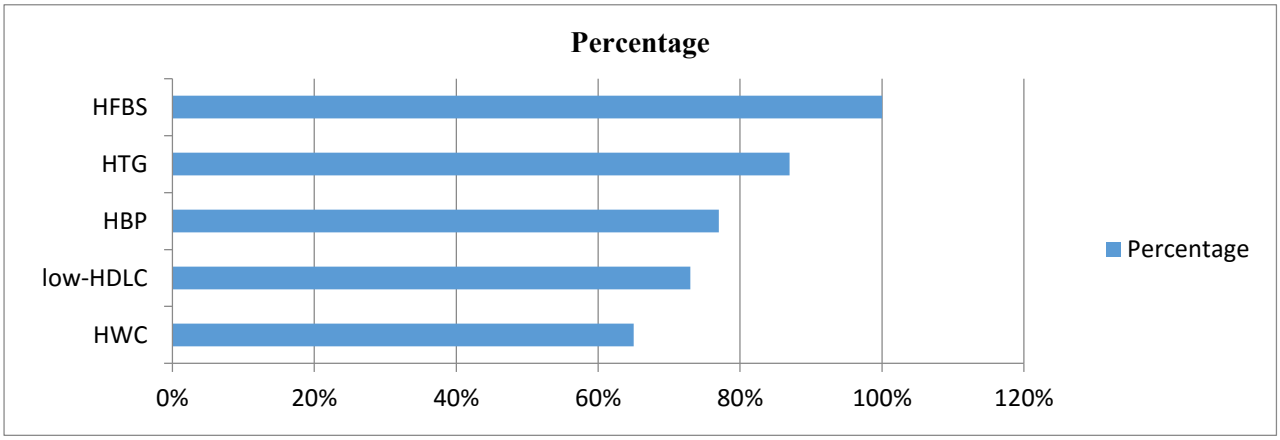

Figure 1: Parameters of metabolic syndrome found in the studied population (having metabolic Syndrome); HFBS: High Fasting blood sugar; HBP: high blood pressure; HWC = High waist circumference;

Physical activity:

33 % of the studied population has a low physical activity, 47% have a moderate activity and only 20 % have a high physical activity, there's no significant deference between male and female.

Table 3: physical activity level compared to syndrome metabolic associated factors

	Low	Moderate	High
HFBS (n=62)	37 (59.7%)	17 (27.4%)	8 (12.9%)
HTG (n=50)	36 (72%)	8 (16%)	6 (12 %)
HBP (n=41)	32 (78%)	6 (14.7%)	3 (7.3%)
Low-HDLC (n=32)	23 (72%)	6 (19%)	3 (9%)
HWC (n=34)	30 (88%)	4 (12%)	0

The results shows in table 3 that 88 % of our sample that have a high waist circumference declared a Low physical activity, followed by High blood pressure with 78%, High triglycerides and Low –HDL has both declared 72%, and finally only 59.7 % for those with High fasting blood sugar .

Table 4: Results of comparative data in both groups with and without metabolic syndrome according to physical activity level

Level of physical activity	Group1 without MS (n=274)	Group 2 with MS (n=26)	P
Low	74	25	<0.05
Moderate	140	1	<0.05
High	60	0	<0.05

The table 4 shows that there's a significant relation between level of physical activity and the presence or, the absence of metabolic syndrome, 96% of patients who has metabolic syndrome have a low physical activity, and 4% with a moderate level.

5. DISCUSSION

Our study found a prevalence (8.6 %) of metabolic syndrome, with hyperglycemia as the most encountered associated factor; it increases with age and BMI (Body mass indicator).We found a preponderance of the lipidic metabolism disorders among patients with metabolic syndrome: 87% had HTG and more than a had 73% hypo-HDLemy. The dyslipidemias are often caused by a single or multiple gene mutations that result in either overproduction or defective clearance of TG and LDL cholesterol, or in

underproduction or excessive clearance of HDL and as Secondary causes sedentary lifestyle with excessive dietary intake of saturated fat, cholesterol, and Trans fats (9). The metabolic syndrome is strongly related on obesity and in particular to visceral obesity (10). In our study, it was found at 65%. It seems wellness the central anomaly in the genesis of the metabolic syndrome; increase in visceral grease induced an increase in the free fatty-acids towards the liver, as well as an insulino resistance. These two relays will induce themselves a cascade of anomalies touching of many pro atheromatous risk factors as well as the glycoregulation, explaining the evolutionary risk towards the diabetes of the type 2 and the complications cardiovascular(11-12-13).

Our study shows that a low physical activity increases the risk of getting metabolic syndrome by affecting its associated factors, as it shows in table 3, so a high and moderate level of physical activity can reduce many risk factors. The regular practice of physical activity promotes metabolic adaptations that facilitate the regulation of energy and fat balance. These effects are important for a better control of body weight in the obese individual and should enable him or her to involve adipose tissue to a lesser extent in this regulation. Physical activity favors a negative energy and fat balance, particularly if activities are prolonged and vigorous. The achievement of a negative energy and fat balance with physical activity also strongly depends on the nutritional context in which it is performed. In the long term, an active lifestyle and low-fat food habits are expected to induce a substantial body weight loss in the obese. This weight loss is progressively attenuated over time, presumably because of the decreased impact of a reduced adipose tissue mass on the regulation of energy and fat balance. For the obese individual complying with an activity program and healthy food habits, a body weight loss of 10% is a realistic goal before the occurrence of resistance to further loss of body fat.(14).

6. CONCLUSION

Metabolic syndrome is installing slowly but certainly in Morocco, and his both a threat and an opportunity: while it clarifies the danger of spectacular increase in cardiovascular disorders, of the diabetes of type 2 and their consequences, it also constitute an opportunity to identify the people at the risk and to implement strategies of prevention while acting early on its parameters. Physical activity is an important key to many health problems that is in relation with MS,

Encouraging Physical activities and healthy life styles will surely minimize serious public health problems in this country.

7. RECOMMENDATIONS

-A Comparison between metabolic syndrome other definitions and Physical activity is recommended.

- Making more researches and studies using other methods for measuring physical activity.

- Further research can be done in other cities

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