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Designing a Test to Measure Sport Skill Performance for Futsal

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ABSTRACT

The problem of the study was that futsal suffers from some obstacles including the adoption of non-scientific means in performance evaluation depending completely on personal experience of the evaluator. This makes it lack accurate tests to determine levels of skill performance through measurements and tests. Accordingly, the problem of the study shows that there is no specific test to measure skill performance. Thus, there are no standard levels of this performance being an important means to determine the level of learners' performance. This is to evaluate the extent of advance of learners or players in addition to evaluating weakness and strength points in the set educational or training courses. The researcher aimed to design for the test designed to evaluate skill performance level in futsal for students of the third stage of the Department of Physical Education and Sports Science in Faculty of Basic Education and to identify standard levels of the test designed for skill performance of students in futsal subject. The researcher used the descriptive survey method on a sample of the third stage students in the Department of Physical Education and Sport Sciences, morning period at the Faculty of Basic Education - Mustansiriya University, for the academic year (2014-2015 AD), totaling 87 students and formed a percentage of (72.5%) of the original research population. The researcher has reached several conclusions including the fact that the test designed by the researcher has proved its validity for measuring performance skills of futsal player. The researcher also recommended the use of the test designed to measure the skill performance of futsal players and adoption of grades and standard levels reached by the researcher during evaluating skill performance of third stage students in the futsal subject.

Keywords: Test design, skill performance, futsal

INTRODUCTION

Significance of the Study

Skill performance for futsal players, whether students or players, is the main and significant role to make good preparation which ensures persistent performance with high efficiency and accuracy along competition period. Correct and good building of learners and players forms a great significance in the preparation process. It ensures

proper functioning of skills and movements during the match in all circumstances with high efficiency through which they can confront difficult conditions and situations during a competitive performance. They can be reached using correct scientific methods that serve both training and teaching processes. This is to enhance and refine their performance skills and stay away from wrong behavior in performance. This only comes through the adoption of scientific methods which enable the teacher and the coach to know the error with his students or his players and treating them during educational or training units. Skill performance measurement process and determining its levels is one of the main factors to focus on at the basis of being a real indicator to determine degrees of continuous development along application of the course taken, whether educational or training one.

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Evaluation of skill performance of the learner or the player is one of the key factors by which the learner is prepared and provided with the main expertise and skills of futsal and being able to adapt to conditions of competition in the future. This is because the process of “evaluation must not be subjective depending on views of evaluators, but it must be an objective evaluation by relying on test and measurement, as tests and measurements give reliable objective results in accuracy and validity of if they are based on scientific foundations (Abduljabbar et al., 1987: p. 11).”

When it comes to the need to use evaluation continuously on skill performance level for learners in futsal, the researcher sought to design a test to measure the skill performance of the futsal players, and thus, determine the degree of standard levels of skill performance to identify current levels of learners and evaluate them accurately through the use of standards, which are the best types of levels as “the feature that is used as a benchmark to judge the importance or the value of something (Hatab et al., 1986: p. 118).” The significance of the study lies in setting a test that measures the skill performance as well as finding grades and standard levels of performance skills to students through which they can identify their level of performance after the end of the semester to learn the effectiveness of the educational curriculum in teaching futsal subject.

Problem of the Study

The process of designing, a special test to find standard degrees to assess the level of skill performance will help teachers and coaches alike in identifying levels of learners and players accurately, showing what can be achieved from attempts to improve the level of their performance and trying to interpret, diagnosing the strengths and weaknesses, and working to treat them. The futsal game suffers from some constraints, which include the adoption of non-scientific means in performance evaluation and completely depend on the personal experience of evaluators, which makes it lack an elaborate battery to determine skill performance levels through measurements and tests. Accordingly, the problem of the was identified by the non-existence of special test to measure the skill performance of the athletes in this game as an important means to know the level of performance of the learners, evaluate the progress that a player or learner as well as evaluate strengths and weaknesses in educational or training curricula.

Objectives of the Study

1. To design a test to measure sport skill performance in futsal game.
2. To find a standard degree of the test design to evaluate the level of skill performance in futsal game for the third stage students in the Department of Physical Education and Sport Sciences at the Faculty of Basic Education - Mustansiriya University.
3. To determine standard levels of the test designed for skill performance of students in futsal game.

METHODOLOGY

The researcher used the descriptive survey method as it is appropriate to nature of the study.

Population and Sample of the Study

Population of the study consists of third stage students in the Department of Physical Education and Sport Sciences at the Faculty of Basic Education - Mustansiriya University (120 students). As for the sample, it consists of 87 students after eliminating the failed students, delayed students, and students in whom both exploratory trials were applied. This sample on which the test was applied represented a percentage of 72.5% of gross total of the study population.

Proposed Test

Skill performance validity test (Sadek, 2013: p. 22)

The proposed test was written on questionnaire forms and presented to a group of experts and specialists to determine its validity. After collecting forms, the test was finally written after collecting views of specialists who agreed that the test is valid after legalization.

Exploratory trial

Two exploratory trials were conducted before starting to implement final trial as follows:

- First exploratory trial: This trial was conducted on Wednesday 18/03/2015 on a sample consisting of 5 students selected randomly from the population of the study from a population of the study. The goal of this study was:
 1. To determine problems and difficulties that face researchers at applying trials
 2. To determine how appropriate the devices and tools are
 3. Determine suitable number to manage the

test and train the work team

4. Determine the necessary time to perform the test.
- Second exploratory trial: This trial was applied on Wednesday 25/03/2015 on a sample of 7 students selected randomly from the population of the study. The purpose of this trial was to find validity, reliability, and objectivity coefficients for the test.

Scientific Basics of the Test

Test validity

Validity coefficient of the test was determined using differential validity. The test was applied on a sample of 7 first class players (players of Talaba Sporting Club) and a sample of 7 students. The significance of differences between both samples was counted using the (T) test for small samples and found that there are statistically significant differences and for first class players as shown in Table 1.

Test reliability

The researcher used the retesting method to determine reliability coefficient by reapplying the test on the randomly selected sample of the population of the study (7 students). After a single week of the first test, the correlation coefficient was determined to be 0.904. This shows that the test was conducted with a high-reliability degree. The test should be reliable if the correlation coefficient was 0.90 or more (Al Fartousy et al., 2015: p. 220) as shown in Table 2.

Test objectivity

Subjectivity is defined as “the degree of agreement between two judges who tested the same sample in performing a certain skill (Magid et al., 1992: p. 153).” Test objectivity was determined by counting simple correlation between first and second judges in counting total performance duration of skill validity test. Correlation coefficient between both judges was 0.985 that is a very high coefficient which refers to test objectivity. References assert test objectivity as the correlation coefficient between judge results was 0.85 and more 141:11 as shown in Table 3.

Final implementation of the test

After ensuring test validity by results of both exploratory trials and provided its scientific properties, it was applied on the sample of the study (87 students) on 31/03/2015 with consideration of all procedures in the exploratory trial during the final implementation of the test.

PRESENTING AND DISCUSSING RESULTS

Results of Normal Distribution of the Study Sample

Normal distribution and test consistency of the study sample were ensured (third stage students in the Department of Physical Education and Sport Sciences, morning period at the Faculty of Basic Education - Mustansiriya University) using the Kolmogorov-Smirnov (K-S) test for normal distribution using the Statistical Package for the Social Sciences (SPSS) as follows in Table 4.

Table 5 shows the standard grades of crude and the corresponding grades and levels of standard and number of testers and the proportion in the honest test of the performance of the skill.

Discussing Results of Normal Distribution

Through Table 4, concerning the (K-S) test, we find that the significance value equals to 0.200, which is bigger than 0.005 representing standard significance level for the significance degree. This reduces the zero possibility, which says that data follow a normal distribution (Gouda, 2008: p. 143). At drawing data using SPSS, we find that the sample position on normal distribution curve as in Figure 1 and sample distribution around the inclined line, which represents the standard level of normal distribution. The more points are gathered around this line; this signifies that the sample follows normal distribution (Gouda, 2008: p. 144) as in Figure 2.

Determining Standard Levels of Sadek Test for Skill Performance

There is no difficulty in obtaining raw degrees extracted from the test under study such as difficulty of comparing

Table 1: Arithmetic mean, SD counted and tabulated (T) values for the skill validity test

Skill validity test	Players		Students		Counted T value	Tabulated T value	Significance
	Mean-	SD±	Mean-	SD±			
	38.23	2.88	57.32	3.95	19.005	2.44	Significant

Freedom degree is 6 and significance level is 0.05. SD: Standard deviation

Table 2: Statistical parameters of first and second tests for reliability sample and their correlation coefficient

Skill reliability test	First-test		Second-test		Correlation coefficient value
	Mean-	SD±	Mean-	SD±	
	46.58	4.79	46.52	4.88	0.904

SD: Standard deviation

Table 3: Statistical parameters of first and second judge results and their correlation coefficient

Sadek skill test	First-judge		Second-judge		Correlation coefficient value
	Mean-	SD±	Mean-	SD±	
	41.98	0.613	41.92	0.619	0.985

SD: Standard deviation

Table 4: Statistical parameters of normal distribution using the (K-S) test

Test	K-S ^a			Shapiro-Wilk		
	Statistic	Df	Significance	Statistic	Df	Significance
	0.067	87	0.200*	0.978	87	0.144

^aLilliefors significance correction. *This is a lower bound of the true significance. K-S: Kolmogorov-Smirnov, Df: Degrees of freedom

Table 5: Standard degrees, raw degrees, standard levels, number of respondents and their percentage in Sadek skill performance test

Standard degree	Raw degree	Level	Respondent (n)	Percentage
2-3	<84	Very good	0	0
1-1, 99	92.85-87.6	Good	16	18.39
0-0.99	98.17-92.84	Average	28	32.18
-1--0.1	103.47-98.18	Acceptable	30	34.48
-2--1.1	108.99-104.03	Weak	9	10.34
-3--2.1	>109	Very weak	4	4.59
Total			87	100

these degrees together as they, as degrees, do not have significance unless does not transform into standard degrees that are considered “means to determine relative condition of raw degrees, thus these degrees can be explained and their results can be evaluated (Allawi et al., 1988: p. 179).” Since Sadek Skill Performance Test contains many stages measured by different units, these degrees must be accurately described as raw degrees obtained by applying the test on students are “of a limited benefit without transforming into standards or levels (Abdulhamid et al., 1973: p. 302).”

Hence, the researcher transformed raw degrees of the sample in the test under study into standard degrees

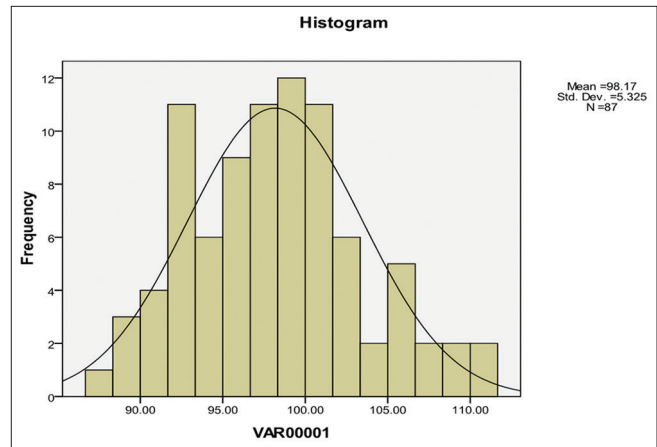


Figure 1: Normal distribution of the study sample

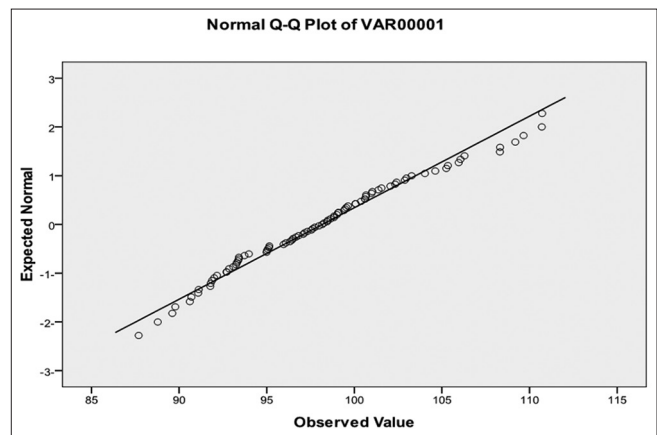


Figure 2: Collection of observed values for results of the study sample around inclined line of normal distribution

and modified standard degrees using the SPSS as shown in Annex 3.

Discussing Findings of the Study Sample in Sadek Skill Performance Test

After viewing results of the test, it was shown that the level (very good) did not achieve any percentage. This means that no one of respondents reached this level while performing the test, while respondents achieved a percentage up to more than half the number of respondents in the levels (good and average), while they achieved more than a third of their total in the level (acceptable). The number respondents who have achieved results to put them at levels (weak and very weak) did not reach quarter of the number of respondents. The researcher attributes the cause of inability of respondents to achieve any proportion of the level (very good) as they are students and not belonging to futsal clubs as they are practitioners of the game, amateurs, and not professionals by any who are not

athletes in the high levels, so they did not achieve the results at this level while we find that they have achieved a high rate in the levels (good and average). If we add the percentage in the level (acceptable), we find that the ratio rises much further to reach (85.05%), which is a very large proportion attributed by the researcher that they are not beginners, but they are students of the third stage. This means that they had engaged in this game for four courses scattered between three football courses and a futsal course. In general, students at this stage have acquired and perfected the skills of many sports they had studied for six courses, so their results in these sports and games are distributed between levels (good - acceptable) and their lineage could rise and may decrease in the levels (weak and very weak). This corresponds with findings of the (Tamimi) study by saying that “most of the research sample students were at level (average), and if we add their lineage in the good and acceptable levels, it will form a rate of up to more than 88% of the sample (Tamimi, 2007).” Finally, the researcher asserts that these standards, as well as levels that resulted it, are non-permanent since they are subject to change and are not fixed, “using criteria tables for a specific period because individuals’ capabilities vary from time to time and must be renewed every few years to fit with the individuals (Farahat, 2007: p. 182, 183).”

CONCLUSIONS

1. The test designed by the researcher proved its validity to measure skill performance of futsal players
2. The study concluded standard levels of the designed test
3. It was found that most students of the study sample were at average and acceptable levels with almost equal percentages
4. It was found that the percentage of students at good level is higher than the percentage of those at weak and very weak levels altogether.

RECOMMENDATIONS

1. Using the test designed in measuring skill performance for futsal players
2. Using standard degrees and levels that have emerged through research findings in the evaluation of results of the third stage students (males) in the Department of Physical Education and Sports Science of the Faculty of Basic Education - Al-Mustansiriya University in futsal subject
3. Finding standard degrees and levels of male and female players of the national futsal team
4. Finding standard degrees for the third stage students of the Department of Physical Education and Sports Science of the Faculty of Basic Education - Al-Mustansiriya University.

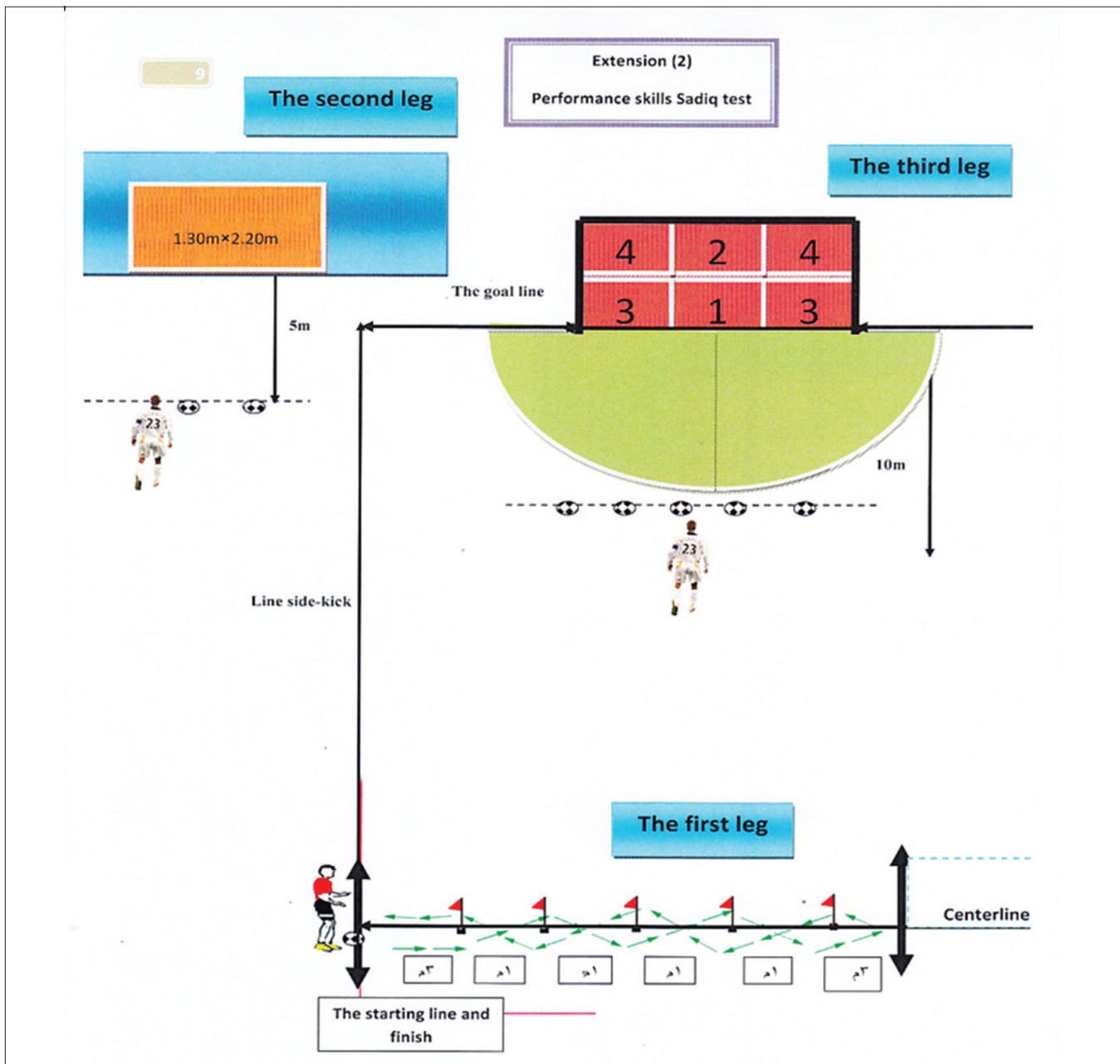
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ANNEX 1

Registration Form

S. No.	Name	Dribble duration	Number of passes (5 attempts)	Number of scoring points (5 attempts)	Total duration	Final duration after discount
1						
2						
3						
4						
5						
6						



ANNEX 2**Raw degrees, standard degrees, and modifying standard degrees of results of Sadek skill performance test**

Modified standard degrees	Standard degrees	Raw degrees	Modified standard degrees	Standard degrees	Raw degrees
48.7	-0.13	98.85	69.68	1.97	87.69
48.4	-0.16	99.01	67.63	1.76	88.78
48.25	-0.17	99.09	66.07	1.61	89.61
48.25	-0.17	99.09	65.75	1.58	89.78
47.65	-0.23	99.41	64.19	1.42	90.61
47.54	-0.25	99.47	64.02	1.4	90.7
47.41	-0.26	99.54	63.29	1.33	91.09
47.22	-0.28	99.64	63.23	1.32	91.12
46.41	-0.36	100.07	61.99	1.2	91.78
46.41	-0.36	100.07	61.95	1.2	91.8
45.83	-0.42	100.38	61.8	1.18	91.88
45.39	-0.46	100.61	61.58	1.16	92
45.39	-0.46	100.61	61.28	1.13	92.16
45.3	-0.47	100.66	60.24	1.02	92.71
45.28	-0.47	100.67	60.24	1.02	92.71
44.7	-0.53	100.98	59.98	1	92.85
44.61	-0.54	101.03	59.53	0.95	93.09
43.95	-0.61	101.38	59.23	0.92	93.25
43.63	-0.64	101.55	59.15	0.92	93.29
42.67	-0.73	102.06	59.02	0.9	93.36
42.16	-0.78	102.33	58.95	0.89	93.4
42.01	-0.80	102.41	58.93	0.89	93.41
41.13	-0.89	102.88	58.33	0.83	93.73
40.94	-0.91	102.98	57.86	0.79	93.98
40.39	-0.96	103.27	55.96	0.6	94.99
38.97	-1.10	104.03	55.92	0.59	95.01
37.86	-1.21	104.62	55.83	0.58	95.06
36.67	-1.33	105.25	55.7	0.57	95.13
36.5	-1.35	105.34	55.66	0.57	95.15
35.34	-1.47	105.96	54.14	0.41	95.96
35.15	-1.48	106.06	53.89	0.39	96.09
34.72	-1.53	106.29	53.42	0.34	96.34
30.92	-1.91	108.31	53.21	0.32	96.45
30.9	-1.91	108.32	53.1	0.31	96.51
29.27	-2.07	109.19	52.8	0.28	96.67
28.38	-2.16	109.66	52.52	0.25	96.82
26.43	-2.36	110.7	52.03	0.2	97.08
26.39	-2.36	110.72	51.88	0.19	97.16
			51.58	0.16	97.32

(Contd...)

Continued..

Modified standard degrees	Standard degrees	Raw degrees	Modified standard degrees	Standard degrees	Raw degrees
			51.15	0.11	97.55
			51	0.1	97.63
			50.77	0.08	97.75
			50.34	0.03	97.98
			49.98	0	98.17
			49.79	-0.02	98.27
			49.45	-0.05	98.45
			49.38	-0.06	98.49
			49.1	-0.09	98.64
			48.72	-0.13	98.84
			48.7	-0.13	98.85

Effect of Physical Exercise on Neurocognitive Performances in University Students

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ABSTRACT

The aim of our study was to determine the effect of acute exercise on neurocognitive functions. 19 trained athletes, aged 20.68 ± 0.82 years, pursuing a program university sports for 3 years and been have evaluated at rest and after an intense physical exercise on cognitive tests: Working memory tests, processing speed tests, perceptual reasoning tests (Wechsler, Intelligence Scale Wechsler tests for Children, Fourth Edition [WISC-IV], 2003), and Rey complex figure test (RCFT). The results show that exercise increased slightly and significantly the performance specifically at the visuomotor coding-decoding system of 4.57%, perceptual skills of 15.45%, the spatial organization of objects 13.39%, and the visuospatial memory tasks of 15.41% (RCFT). The exercise affects positively but selectively on certain cognitive functions. The extension effects of exercise should not be generalized to all the functions. These findings suggest that physical exercise program should be a support of the cognitive enrichment of students.

Keywords: Physical exercise, cognitive function, working memory, processing speed and perceptual reasoning

INTRODUCTION

The relationship between physical exercise and neurocognitive functions is an issue that generated interest from longstanding researches stating that psychomotor learning brings many positive effects on human intellectual functions (Piaget, 1956). Numerous studies have shown that physical exercise has positive effects on neurocognition in healthy adults (Szuhanly et al., 2015; Audiffren et al., 2011; Ratey and Loehr, 2011; Sandroff et al., 2015). A recent systematic review (including experimental, longitudinal, and epidemiological studies) showed that physical activity

may protect against cognitive impairment (Coelho et al., 2009; Sofi et al., 2011; Hamer and Chida, 2009; Sandroff et al., 2015).

The study findings concluded that the neurocognitive improvements affect both children, adolescents, adults, and the elderly either during acute exercises or training sessions of physical activity. In fact, several recent meta-analysis revealed multiple positive associations between physical activity and neurocognition (Etnier et al., 2006; Ratey and Loehr, 2011; Audiffren et al., 2011; Szuhanly et al., 2015).

However, physical inactivity is associated not only to deleterious effects on physical health but also to a decrease in cognitive abilities (Lipnicki and Gunga, 2008). Indeed, several studies have shown the positive effects of exercise training, fitness level, lifestyle physical activity (Dunn et al., 1998), and acute exercises (Dietrich and Audiffren, 2011; Sandroff et al., 2015; Sandroff, 2015) on cognition abilities.

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A single session of physical activity increases attentional performance (span and capacity) and speed of decision making in children and adolescents (Tompsonowski et al., 2011; Gallotta et al., 2012; Budde et al., 2008). Other studies have observed an improvement in cognitive function with increasing reaction time, the magnitude of memory. In experimental studies, it has been observed the positive effects on memory performance after 40 min of playing team sports (Pesce et al., 2009; Budde et al., 2010) and logical memory assessed by the Wechsler Memory Scale (Hill et al., 1993; Tomporowski et al., 2011). Furthermore, the executive functions are varied positively through physical education (Kubesch et al. 2009; Hill et al. 2010; 2011) and even in a month of fasting, the work memory and visual perception increase significantly after exercise (Lotfi et al., 2010). In other studies, it has been concluded that aerobic activity in physical training increases the ability of solving mathematical problems (Gabbard and Barton, 1979; McNaughten and Gabbard, 1993; Lojovich, 2010; Bala, 2014).

The neurophysiological mechanisms, which are often mentioned in literature as explaining the regular physical activity effect, are related on the one hand at an increasing in regional cerebral blood flow, activating of synaptic plasticity, neurogenesis, and brain catecholamines, and on the other at the effort invested in cognitive tasks. The purpose of this study is to evaluate the effects of intense exercise on neurocognitive functions related with working and visual-spatial memory, processing speed and perceptual reasoning. This work is part of a strategy to improve cognitive and academic performance.

MATERIALS AND METHODS

Participants

About 19 healthy university students were recruited for this study aged 20.68 ± 0.82 years, with a body mass index of 21.27 ± 2.05 . All subjects recruited from Physical Education Program at the Hassan II University, Casablanca and pursued 2-4 regular physical training sessions per week during 3 years. All of the subjects were informed of the purpose and procedures of the tests, and informed consent was obtained before the commencement of the study.

Research Design

The subjects were evaluated at rest and 15 min after the exercise test on cognitive tests: Working memory

tests, processing speed tests, perceptual reasoning tests (WISC-IV, 2003), and Rey complex figure test (RCFT), whose the psychometric properties are very strong. The peer items of each test are administered at rest and odd items after exercise. The test administration order is reversed in the second phase of the evaluation to preserve the same duration of both sides of physical exercise. Before each passing tests, some repetitions were performed to familiarize them and avoid the effect of learning.

Physical Test

The physical exercise performed is a speed running on foot 250 m realized in the form of timed competition in a circular track 250 m athletics, after warming up for 5 min. This test mobilizes the capacity of the anaerobic system, sufficient to induce a significant cardiovascular activity, and an increasing in blood lactate accumulation.

Working Memory Tests

The memory tests are used to assess the short-term auditory memory, sequencing capabilities, attention, and concentration (Wechsler, 2003). It contains two subtests: The digit span (forward and backward).

The digit span forward (DSF) is formed by eight-digit sequences with progressive difficulties, which are played on one after the other that must be repeated in the same order (each sequence is composed of two different series).

The digit span backward (DSB) is also formed by eight-digit sequence to which the subject restores them in reverse order. The sequences of figures presented at rest and after exercise are different.

The calculated scores are: The total score in memory numbers (MW) is the sum of the marks obtained in the two subtests (Baddeley, 1986): DSF and DSB, each is scored on 16 points. $WM (32 \text{ points}) = DSF (16 \text{ points}) + DSB (16 \text{ points})$.

The span memory (SM) corresponds to the amplitude of the memory. It is cleared from the number of digits returned correctly in the block the last test in each subtest. The span in memory (SM) is the sum of the marks obtained in SM forward (SMF) noted on 9 points and in the SM backward (SMB), recorded on 8 points.

$SM (17 \text{ points}) = SMF (9 \text{ points}) + SMB (8 \text{ points})$

Letter-number sequencing (LNS) assesses mainly short-term auditory memory, the ability to make sequences, attention, and concentration. It requires examinees to recall numbers in ascending order and letters in alphabetical order from a given number and letter sequence. The subject must repeat 10 sequences of numbers in the same order and reverse order then. The evaluator reads a sequence of letters and numbers and the subject must return, starting with the numbers in ascending order, then the letters in alphabetical order.

The scores of WM and LNS subtests are transformed into standard notes, then an index of working memory (WMI) using the scoring tables proposed by Wechsler, 2003 (WISC IV). The WMI assesses the attention, concentration, and working memory. The internal consistency coefficient in these tests is very high (0.92).

Processing Speed Tests

Coding subtest (CD)

The subject copies symbols matched with numbers and utilizing 9 symbols randomly presented in a limited time. This test evaluates primarily the velocity of information processing, short-term memory, visual discrimination, visual perception, visual-motor coordination, visual scanning and attention, and cognitive flexibility (Wechsler, 2003).

Symbol search subtest (SS) (Wechsler, 2003)

The test takes place in 120 seconds during which the subject observes a series of 60 different items each formed of a series of five symbols and must decide each time, as soon as possible if one of two target symbols is present or not in the series. The test assesses visual perception, i.e. the capacity and processing speed of visual information (Flanagan and Kaufman, 2004; Sternberg, 1995). The internal consistency coefficient in the SS is very high (0.91).

The scores obtained in both tests (CD and SS) are transformed into standard note and a processing speed index (PSI) according to scoring tables proposed by Wechsler, 2003 (WISC IV), The PSI assesses the abilities to focus attention and quickly scan and discriminates between and sequentially order visual information and the graphomotor capacity.

Perceptual Reasoning Tests

Block design subtest (BD)

The subject uses colored cubes to reproduce a construction, in a determined time, from a model

presented in different forms. This test evaluates primarily the analytical capacity and synthesis of abstract visual stimuli.

Picture concepts subtest (PC)

The subject observes two or three rows of pictures and selects one picture from each row to form a group with a common characteristic. This test consisting of 28 items, measures the categorization and abstract reasoning.

Matrix reasoning subtest (MR)

The subject views an incomplete matrix or series and selects the response option that completes the matrix or series. This test consisting of 36 items, evaluates primarily the processing of visual information and abstract reasoning. The subject observes an incomplete matrix in series and selects the response option that completes the matrix among five possible answers.

The scores obtained in the three tests (BD, PC, and MR) are transformed into a standard note and a perceptual reasoning index (PRI) according to scoring tables proposed by Wechsler, 2003 (WISC IV). The PRI assesses the perceptual reasoning and organization.

RCFT

The RCFT is developed by André Rey-Osterrieth, in 1941, and standardized by Osterrieth, in 1944, and recalibrated by Mesmin and Walloon, 2011, allows the assessment of executive functions such as visual-spatial abilities and visuoconstructive, non-verbal memory and working memory, attention, and planning. It is a neuropsychological test. The figure is composed of 18 elements organized in 3 parts: Overall shapes (rectangles) and external members (squares, crosses, and triangles) and the internal components to the overall shapes (internal, lines, and circles). It is administered in two phases, reproduction by direct copying of the figure (unaccounted), followed by 2 min of memory reproduction, it indicates what spontaneously remained in memory. It is the latter which is considered in notation according to a rating scheme Boston qualitative scoring system (qualitative rating system Boston).

Data Analysis

The comparison of averages scores at rest and after exercise for each test is analyzed by the non-parametric Wilcoxon t-test valid for dependent samples, with significance threshold set at $P < 0.05$. The data were processed with SPSS (21).

RESULTS

Variation in the parameters of the scores of memory, processing speed, and perceptual reasoning at rest and after exercise are presented in Table 1. It is noticed that compared to the values obtained at rest, there is a significant increase ($P < 0.05$) after exercise at the CD test (4.57%), SS (15.45%), BD (13.39%), and figure Rey (15.41%), whereas the means of the working memory index (WMI) (DSF, DSB, and LNS), PRI (BD, PC, and MR), and PSI (CD and SS), remain stable after exercise.

Results regarding memory span scores at rest and outside of exercise are presented in Figure 1. The average of the scores obtained at the SMF (6.00 ± 1.09 vs. 6.36 ± 1.08) and SMB (5.21 ± 1.43 vs. 5.64 ± 1.55) after exercise were not significantly varied compared with at rest values. While the averages scores of the RCFT increase significantly ($P < 0.008$) of 15.41% after exercise.

DISCUSSION

The aim of our study is to evaluate the effect of physical exercise on cognitive function. For this, we conducted an experimentation on 19 healthy university students athletes, assessing three neurocognitive indexes: The WMI, PRI, and the PSI before and after exercise, referring to the intelligence scale Wechsler (WISC-IV, 2003), and the visual-spatial memory by the RCFT.

The results obtained from this study show that exercise increased slightly and significantly the performance

specifically at the visuomotor coding-decoding system of 4.57% (CD), perceptual skills of 15.45% (SS), the spatial organization of objects 13.39% (BD), and the visuospatial memory tasks of 15.41% (RCFT), and no effect recorded in the Wechsler Index Scores of cognitive functioning (WMI, PSI, and PRI). These results partially assume the model that physical exercise has a positive impact on the functions of cognitive skills of the subjects practicing physical activity.

Indeed, several meta-analyses have shown a causal relationship between physical exercise (moderate- to high-intensity exercises) and cognitive performances and that the size of this effect is moderate to large (Audiffren et al., 2011; Colcombe and Kramer, 2003; Angevaren et al., 2008; Smith et al., 2010). Other epidemiological studies have often reported a positive correlation between physical fitness and vitality of neurocognition (Barnes et al., 2003).

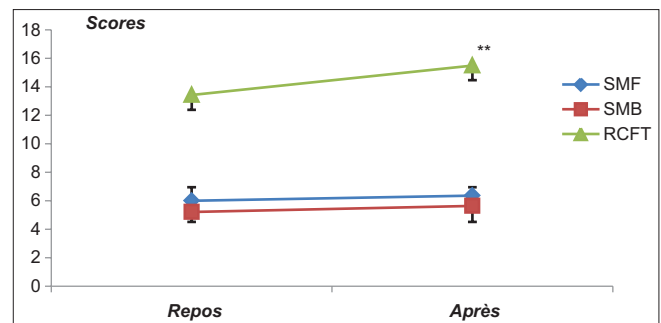


Figure 1: Variation in the span in memory forward, span in memory backward, and Rey complex figure test at rest and after exercise. **significant variation, $P < 0.05$

Table 1: Variation of test scores of memory, processing speed, and perceptual reasoning at rest and after exercise (n=19)

Parameters	Tests	At rest	After exercise	Wilcoxon test	
				Z	P value
Processing speed	Coding test	95.45±13.00	99.82±19.59*	-1.958	0.050
	Symbol search	31.18±5.53	36.00±9.61*	-2.398	0.016
	Processing speed index	113.87±17.67	122.20±18.98	-1.679	0.093
Work memory	Digit span forward	9.93±2.37	10.07±2.31	-0.321	0.748
	Digit span backward	10.60±2.20	10.13±2.13	-1.116	0.264
	Letter-number sequencing	20.73±3.29	20.18±3.16	-0.655	0.512
	Working memory index	100.56±15.03	98.31±16.76	-0.948	0.343
Perceptual reasoning	Picture concepts	11.42±1.00	11.08±1.31	-0.877	0.380
	Matrix reasoning	14.92±1.44	14.33±1.67	-0.873	0.382
	Block design	23.00±3.41	26.08±2.43*	-2.953	0.003
	Perceptual reasoning index	97.71±13.05	102.07±13.36	-1.061	0.289

Data are presented mean±SD. *Significant comparison with $P < 0.05$. SD: Standard deviation

Considering the results of this study, the acute exercise has mobilized the spatial memory ability is the part of memory responsible for recording information about one's environment and its spatial orientation and the processing speed capabilities of information, visual discrimination, visual perception, visual-motor coordination, visual scanning, and discrimination as well as attention and cognitive flexibility, which are evaluated in this study by the CD subtest and SS subtest by Wechsler scale (2003). During practicing physical exercise, the appearing and disappearing of all play objects (the movements of the defenders, attackers, the ball, and the body) require permanently complex perceptual-cognitive skills: Perceiving opportunities into free space, judging distances, actions anticipation, trajectory analyses, and good visual field.

Some experimental studies have concluded that an exercise program increases significantly several regional brain volumes (frontal lobes, dorsal anterior cingulate cortex, supplementary motor area, and gyrus) that are implicated in the attentional control and memory processes (West, 1995; Duncan and Owen, 2000; Gunning-Dixon and Raz 2003; Colcombe et al., 2006). Specially, the gyrus plays a critical role in several higher brain functions such as learning, memory, and spatial CD (Jonas and Lisman, 2014). Different neurophysiological mechanisms involving activation process of central nervous system (synapses, motoneuron, and neuron activation [P3 component]) and neurotrophic factors (brain-derived neurotrophic factor, insulin-like growth factor-1, and c-Fos) released during exercise could explain the brain plasticity: Cognitive control and spatial, working memory, processing speed, attention, and executive function (Smith et al., 2010; Voelcker-Rehage and Niemann, 2013; Bherer et al., 2013).

On the other hand, the catecholamines are responsible for many adaptations both at rest and during exercise. Among these, responses are the substrate mobilization and utilization capacity to control blood flow in the working muscles, to control cardiac function and metabolism (Mazzeo, 1991; Savard et al., 1989; Hooker et al., 1990), and increase with the workload (Marshall, 1989), then can be used to estimate the sympathetic nervous system activity (Savard et al, 1987).

On another side, the secretions of a certain group of neurotransmitters, i.e. endorphin and dopamine provide a source of pleasure and facilitate the learning

(De Moor et al. 2006). The electric responses (EEG) recorded during the neuromotor process show a three endogenous potential: (1) the P300 (P3) wave occurred especially in the oddball tasks, i.e. detecting the target in a series of different stimuli including many distracters (Van Dinteren et al., 2014; Polich, 2004; 2007), (2) the contingent negative variation is observed in the anticipation tasks and associated with information processing and response preparation (Walter et al., 1964; Ruchkin et al., 1986), and (3) the pre-motor potential or readiness potential is occurred during the motor cortex activity (Kornhuber and Deecke, 1965; Nguyen et al., 2014). Several studies confirmed the cognitive enrichment theory (Hertzog et al., 2009; Hertzog, 2008; Goldberg, 2005) suggesting that all activities related to physical stimulation have a positive impact on the level of neurocognitive efficacy and brain plasticity (Greenwood and Parasuraman, 2010).

Further research should be undertaken to investigate the correlations between academic performance and physical performance, and the effects of sex, age, and the recovery time following the physical training session and also the duration of the positive effects on the brain, examining each time, the cognitive functions, and most sensitive to change.

CONCLUSION

This work was carried out to evaluate the effect of acute physical on the cognitive functions. The main results have shown a significant increase in the visuomotor coding-decoding system, perceptual skills, the spatial organization of objects and the visuospatial memory tasks, and no effect recorded in the Wechsler index scores of cognitive functioning. The exercise affects positively but selectively on certain cognitive functions. The extension effects of exercise should not be generalized to all the functions. These findings suggest that physical exercise program should be a support of the cognitive enrichment of students.

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Motivation for University Studies among Students at Tunisian High Institutes of Sport and Physical Education

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ABSTRACT

Our study aims to identify the motivation of Tunisian students at institutes of sports and physical education to academic studies. The study population consisted of 400 students (200 boys and 200 girls) belonging to different institutes of Sport and Physical Education of Ksar Said, Sfax, Gafsa and El KEF. Our population belongs to the 2nd year LMD. The motivation for the study was measured by "The scale of motivation for studies" (TH-U28) adapted to the college EME-C28-etudes (EME-U28 Vallerand et al., 1989). The results showed that extrinsic motivation self-determined is prevalent among students who participated in the research while the level of amotivation is lower.

Keywords: Intrinsic motivation, extrinsic motivation, amotivation

INTRODUCTION

Like any field of study in psychology and science education, academic motivation is studied in a specific theoretical framework which represents something of a thinking model on which the researcher relies to conduct its investigations. For example, we speak of nativist models in psychology for some fields of research. These researches are based on the idea that human cognition is based exclusively on internal determinants to humans, and often neurobiological kind thus in large part innate, whose development over the life will be dictated by genes each individual.

In contrast to these nativist models, there are the models associationists who defend the idea that it is our physical environment that structures our mental, exclusively, and throughout life. Recently, cognitive-social models have emerged with a new design, a sort of compromise between nativist and associationists. The idea is that human behavior is governed by internal factors but that they have an origin in the environment. Since human communication capabilities, it is mainly the social environment is considered. Considered one of the most important conditions for learning (Wang et al., 1993). What can grow well a student or a student to enroll in college? Ask this simple question apparently is inevitably lift the veil that hides the complexity of the many faces of motivation among students, the motivation to learn has become a problem for an increasing number of university students, why not and academic motivation is probably one of the most important determinants of school performance (Bloom, 1979).

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Indeed, decide to be a student for several years which means choosing one of the ways to go further on the personal and professional. This is an opportunity to deepen their knowledge, acquire a way of learning. According to work by Viau (1994) in this area, academic motivation is a dynamic state that has its origins in student perceptions of him and his environment and the incentive to choose an activity, commit to it and to persevere in its fulfillment to achieve a goal. Work on the student motivation in high school (Viau and Bouchard, 2000) imposed different angles of study, which examines the motivational dynamics characterizing the students in the learning process, that is to say when they must perform activities in a course. Given the magnitude of the problem of abandonment, motivation has become an important factor in research on university students. For example, in the investigation under the ICOPE project (Indicators of Conditions for Further Education), motivation is one of the nine characteristics of success and perseverance in school (Pageau and Bujold, 2000). In this study, as in the majority of the work that has been done on the characteristics of students, motivation is addressed in terms of the reasons that lead them to study at university or in terms of the degree of interest that they manifest for the program in which they are enrolled.

This study is a profound reflection on the nature of the motivation of students to the university. The problem lies not in a lack of motivation of students on their arrival at the university, but in its nature and its decrease or increase throughout their studies. Motivation is the constructed hypothetical used to describe the internal forces and/or external translating the outbreak, the direction, intensity, and persistence of behavior (Vallerand and Thill, 1993).

METHODS

The study population consisted of 400 students (200 boys and 200 girls) belonging to different institutes of Sport and Physical Education of Ksar Said, Sfax, Gafsa and El KEF. Our population belongs to the 2nd year LMD.

The motivation for the study was measured by “The scale of motivation for studies” (TH-U28) adapted the college EME-C28-etudes (EME-U28 Vallerand et al. 1989). The questionnaire includes 28 items distributed according to a Likert scale from 1 to 7 (1 = not agree at all; 7 = strongly agree). It measures three categories of motivation is intrinsic motivation (to knowledge, to the completion and stimulation). The extrinsic

motivation (The external regulation, introjection, and identification) and amotivation.

RESULTS

To verify the psychometric quality built, an orthogonal factor analysis type Varimax (Kaiser, 1958) is performed on our questionnaire based on 28 items and made our study population of 400 students.

The results presented indicate that the scale of motivation in studies (EME-U28 Vallerand et al., 1989) has a satisfactory internal consistency ($\alpha = 0.7782$). Note from the Figures 1-7, students, regardless

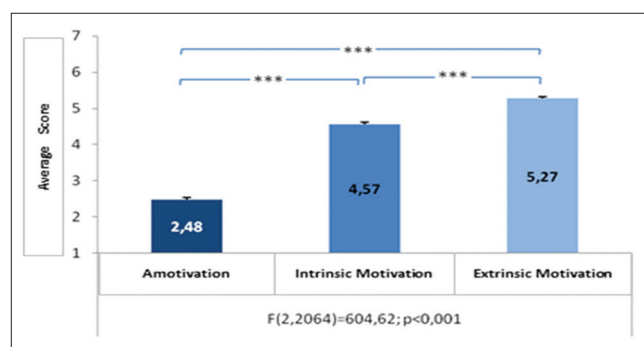


Figure 1: Motivation of the study population regardless of gender and institution. Significant difference at ***P < 0.01

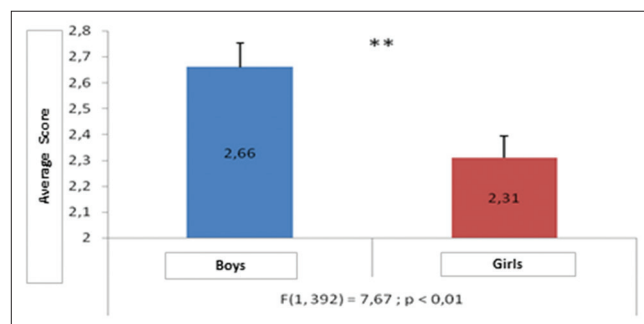


Figure 2: Amotivation by gender. Significant difference at **P < 0.01

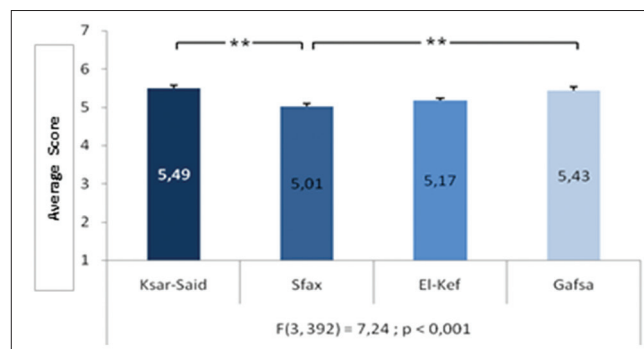


Figure 3: Extrinsic motivation by the four institutions. Significant difference at **P < 0.01

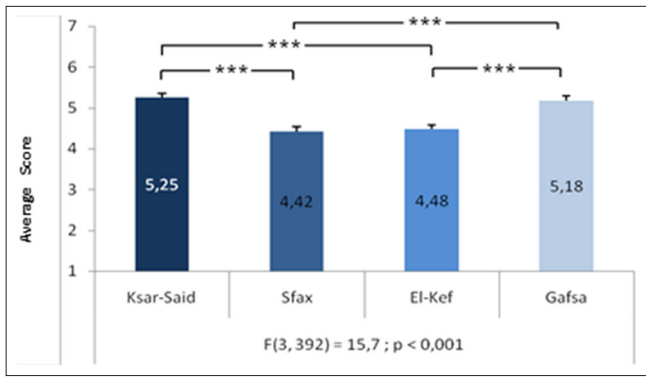


Figure 4: Extrinsic motivation by external regulation by the four institutes. Significant difference at ***P < 0.001

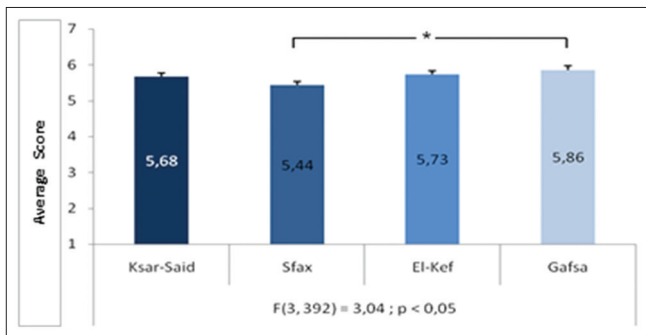


Figure 5: Identified extrinsic motivation by the four institutions. Significant difference at *P < 0.05

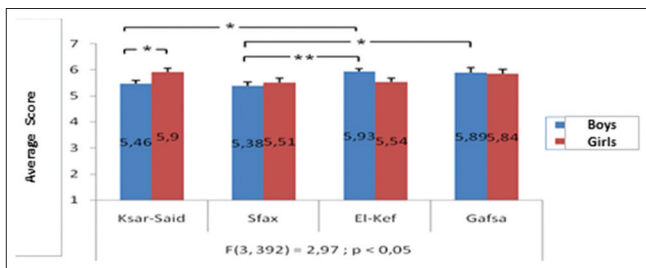


Figure 6: Identified extrinsic motivation by institutes and gender. Significant difference at *P < 0.05; **P < 0.01

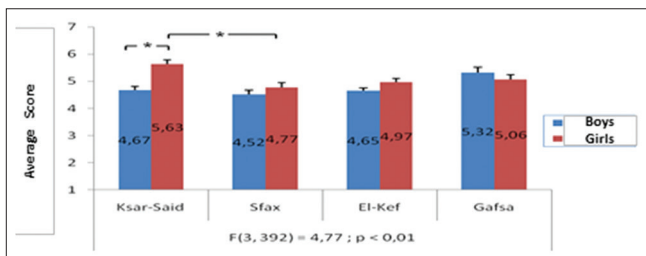


Figure 7: Intrinsic motivation with accomplishment by gender and institutes. Différence significative à *P < 0.05

of sex and institution, have an average score of extrinsic motivation (5.27) that is higher than that of intrinsic motivation (4.57) and amotivation (2.48) (Figure 1).

1. The amotivation by gender: The analysis of variance with two factors showed:

- A leading institute effect ($F [3, 392] = 1.62; P > 0.05$)
- A significant gender effect ($F [1, 392] = 7.67; P < 0.01$)
- An institute versus gender not significant interaction ($F [3, 392] = 2.26; P > 0.05$).

The *post-hoc* analysis showed that, regardless of the institutes, male students (2.66 ± 1.32) have higher amotivation ($P < 0.01$) than female students (2.31 ± 1.19) (Figure 2).

2. Extrinsic motivation by the four institutions: The analysis of variance with two factors showed:

- A significant institute effect with ($F [3, 392] = 7.24; P < 0.001$)
- A non-significant gender effect with ($F [1, 392] = 1.56; P > 0.05$)
- A non-significant interaction of institute versus gender with ($F [3, 392] = 1.56; P > 0.05$).

The *post-hoc* analysis showed that, regardless of gender, student at ISSEP Ksar Said (5.49 ± 0.77) and Gafsa (5.43 ± 0.94) exhibit a higher extrinsic motivation ($P < 0.01$) than students of ISSEP Sfax (5.01 ± 0.92). No difference was observed between the ISSEP el-Kef and three institutes (Figure 3).

3. Extrinsic motivation by external regulation by the four institutes: The analysis of variance with two factors showed:

- A significant institute effect with ($F [3, 392] = 15.7; P < 0.001$)
- A non-significant gender effect with ($F [1, 392] = 0.41; P > 0.05$)
- A non-significant interaction of institute versus gender with ($F [3, 392] = 0.45; P > 0.05$).

The *post-hoc* analysis showed that, regardless of gender, student at ISSEP Ksar Said (5.25 ± 1.06) and Gafsa (5.18 ± 1.2) show a higher extrinsic motivation by external regulation with $P < 0.001$ than students of ISSEP El-Kef (4.48 ± 0.96) and Sfax (4.42 ± 1.21) (Figure 4).

4. Identified extrinsic motivation by the four institutions: The analysis of variance with two factors showed:

- A significant institute effect with ($F [3, 392] = 3.04; P < 0.05$)
- A non-significant gender effect with ($F [1, 392] = 0.12; P > 0.05$)
- A significant interaction of gender versus institute with ($F [3, 392] = 2.97; P < 0.05$).

The *post-hoc* analysis showed that, regardless of gender, student at ISSEP Gafsa (5.86 ± 1.13) exhibit a higher identified extrinsic motivation ($P < 0.05$) than students at ISSEP Sfax (5.44 ± 1). No other significant differences were observed between other institutes (Figure 5).

5. Identified extrinsic motivation by institutes and gender:

The *post-hoc* analysis showed that Ksar Said female students (5.9 ± 0.91) have higher identified extrinsic motivation ($P < 0.05$) than that of male students of the same institute (5.46 ± 0.93). No difference was observed between the sexes in the other three institutes. The comparison between the boys of four institutes has shown that students of El Kef (5.93 ± 0.75) and Gafsa (5.89 ± 1.32) were more extrinsically motivated by recognition than students Ksar-Saïd (5.46 ± 0.93) and Sfax (5.38 ± 1.08). However, no significant differences are reported among girls of the same institutions (Figure 6).

6. Intrinsic motivation with accomplishment by gender and institutes:

The *post-hoc* analysis showed us that the girls at Ksar Said presented an intrinsic motivation with accomplishment higher than boys (5.63 ± 0.89 vs. 4.67 ± 1.1).

By cons, the girls at the Institute of Ksar Said showed an intrinsic motivation with accomplishment higher than girls at the Institute of Sport and Physical Education of Sfax (4.77 ± 1.3) (Figure 7).

DISCUSSION

The results showed that extrinsic motivation self-determined is prevalent among students who participated in the research while the level of amotivation is lower. Recent research has shown that the motivation of an individual to choose a profession rather than another is connected to its self-perceptions efficiency in various school subjects (Lent et al., 1993). A student who feels competent in sport and physical activities and social sciences and biology would be more inclined to be interested in studies in sport science and want to pursue a career in one of his fields. Now, it turns out that the feeling of self-determination of an individual approach science subjects might also explain his interest in studies to ISSEP and perseverance.

The results also show that students have more self-determined motivational profile. Indeed, students

have an extrinsic motivation level identified higher than student's regardless institutes. These results are consistent with those obtained by other researchers (Daoust, 1988; Ryan and Connell, 1989; Senecal et al., 1992). These differences in motivational characteristics between members of both sexes explain, perhaps, the increasing number of female students in the academic domain. The self-determined forms of motivation are associated with greater academic persistence (Vallerand and Bissionnette, 1992).

According to the self-determination theory (Deci and Ryan, 1991), this sense refers to the perception of an individual to be responsible for his actions and to exercise choices and make decisions (De Charms, 1968).

Finally, commitment refers to the effort invested by the student in their learning. Many researches in the education sector have demonstrated the importance of self-determination feelings of competence and commitment to explain the performance and persistence of a student in his studies (Guay and Vallerand, 1996; Senecal et al., 1995; Barbeau, 1994).

Students of the ISSEP El Kef have intrinsic motivation to the higher stimulation than students at ISSEP Ksar Said which provides significant support to the social cognitive approach confirming that human behavior is governed by internal factors but that they were indeed a source in the environment. Overall, the results observed in this research confirm those obtained by other researchers in other settings and with different populations.

CONCLUSION

As a conclusion of this work, we can see that, despite significant obstacles, it is possible to change seats at different levels to stimulate and/or maintain a self-determined motivation among students in STAPS. All theories agree that we must develop intrinsic motivation rather extrinsically. Therefore, it is important that students have a minimum identified regulation to emit the interest, enthusiasm and effort to a university course.

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The Effect of a Proposed Training Program Using the Ball Throwing Machine to Develop Performance Speed on the Counter-attack Skill for Table Tennis Players

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ABSTRACT

The world is currently witnessing a notable development in various aspects of life. All phenomena in the various fields were subject to scientific research as it is the best way to solve many problems. It becomes necessary for physical and sport education, being one of these fields, to keep up with this rapid progress by updating methods used in sport training to reach high levels at all sport activities in general and table tennis in particular. The problem of the study is that most international players are interested in training performance speed in attacking skills, counter-attacking skills with defensive skills in a balanced manner in the single training unit and comparing this with the level of Iraqi players. It was found that they are interested in training on attack and defense skills with limited focus on the speed of performing the counter-attack skill, which leads to lack good performance requirements. The study aims to design a training program using the ball throwing machine to develop performance speed and determine the effect of this program on counter-attack skill for table tennis players. As for hypotheses of the study, there are statistically significant differences between pre- and post-tests in the level of performance speed and counter-attack skill in favor of post-test of the control group, there are statistically significant differences between in favor of post-test of the empirical group, and there are statistically significant differences between the control and empirical groups in favor of post-test of the empirical group. As for human domain of the study, it is represented in table tennis juniors team in Dhuk Sporting Club (10 players) in the period from 15/11/2015 to 31/12/2015 in the table tennis court of Dhuk Sporting Club.

Keywords: Effect, Training, Ball, Tennis, Counter-attack, Skill

INTRODUCTION AND SIGNIFICANCE OF THE STUDY

The world is currently witnessing a notable development in various aspects of life. All phenomena in the various fields were subject to scientific research as it is the best

way to solve many problems. It becomes necessary for physical and sport education, being one of these fields, to keep up with this rapid progress by updating methods used in sport training to reach high levels at all sport activities in general and table tennis in particular.

The concept of modern training puts into consideration the wide basis of individuals of society by determining special goals and scientific basics of training programs (various types of training) to be consistent with general sport and cultural trends of the various general levels to ensure practicing sport as an initial step toward to achieve the support of reaching high levels (Bosaty and Muhammad, 1998: p. 4).

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Table tennis is a sport with a distinctive feature as it includes special skills that distinguish it from other sport activities. In its practice, it depends on using the racket of special characteristics in terms of the size and type of materials covering its surfaces in addition to the ball with special properties in terms of size, manufacture material, diameter, and weight. This requires a high degree of performance speed and neuromuscular consistency between the arm movement of the ball hitter and controller and the movement of trunks, legs, and eyes. These movements cannot be separated (Fekry and El Din, 2002: p. 14).

The nature of performance in table tennis requires a high degree of performance speed. This is evident in the player's ability to perform consecutive moves in the least possible time, so he almost has to increase his performance speed in an attempt to gain points or to keep up with the opponent's performance speed (Shawki, 2002: p. 294). Moreover, one of the most difficult features of table tennis is that it became very fast and its decision-making should be done in a part of a second (International Federation of Table Tennis, 2001: p. 96).

The significance of this study lies in the ability to design a training program for junior players on a scientific basis to develop performance speed, and then, raise the skill performance level in general and the counter-attack skill in particular. The researcher uses training with the latest scientifically technological methods in table tennis training programs (the ball throwing machine) due to the ability to control directions, speed and spinning of the ball thrown out of the device, so training results will be valid and reliable that cannot be found with the human element during performing the same exercises.

Problem of the Study

The problem of the study is that most international players are interested in training performance speed in attacking skills, counter-attacking skills with defensive skills in a balanced manner in the single training unit and comparing this with the level of Iraqi players. It was found that they are interested in training on attack and defense skills with limited focus on the speed of performing the counter-attack skill, which leads to lack good performance requirements.

Objectives of the Study

The study aims to design a training program using the ball throwing machine to develop performance speed

and determine the effect of this program on counter-attack skill for table tennis players.

1. Design a training program using the ball throwing machine to develop performance speed for the study sample's members
2. Determine the effect of the training program on the counter-attack skill for the study sample's members.

Hypotheses of the Study

1. There are statistically significant differences between pre- and post-tests at the level of performance speed and counter-attack skill in favor of the post-test of the control group
2. There are statistically significant differences between pre- and post-tests at the level of performance speed and counter-attack skill in favor of the post-test of the empirical group
3. There are statistically significant differences between post-tests for both control and empirical groups at the level of performance speed and counter-attack skill in favor of the post-test of the empirical group.

METHODOLOGY

The researcher used the empirical method using one of the empirical designs which are the empirical design of two groups; control and empirical groups using pre- and post-tests for both groups.

Population and Sample of the Study

The sample of the study was selected purposively from table tennis juniors team in Dhuk Sporting Club registered in files of the Iraqi federation of table tennis under 15 years for the season 2015-2016.

Table 1 shows that the population of the study is 14 players from which there are 10 players (71.4%) of the basic sample of the study and 4 players (28.6%) of an exploratory sample of the study.

Matching Sample of the Study

The researcher divided the sample of the main trial (10 players under 15 years) into two groups. Each group consists of five players due to matching procedures at the level of basic, physical, and skill variables under study.

Table 2 shows symmetry between the control and empirical groups in variables of the study as the tabulated (T) value was bigger than the counted one.

Table 3 shows that there are statistically significant differences between pre- and post-tests for the control group in physical variables as the counted (T) value was bigger than the tabulated one at significance level 0.05

except for passing in 10 s test and number circles, while in skill variables the counted (T) value was bigger than the tabulated one at significance level 0.05 except for the counter-attack after third ball test.

Table 1: Description of the sample of the study

Total sample No.	Exploratory samples	Basic trial sample	Both groups of the study	
			Empirical group	Control group
N (%)	N (%)	N (%)	N (%)	N (%)
14 (100)	4 (28.6)	10 (71.4)	5 (35.7)	5 (35.7)

Thus, it becomes clear that the adopted traditional program with the control group had a positive effect on enhancing physical and skill variables under study except for the test of passing in 10 s and number circles test in physical variables except for the counter-attack test after the third ball in skill variables. The researcher attributes this due to the training program

Table 2: Significance of differences between pre-tests for the empirical and control groups to show matching in basic variables of the study

Variables (N1=N2=5)	Mean±SD		F	(T) value
	Empirical group	Control group		
Growth variables				
Length	154.70±4.75	155.30±4.70	0.59	0.27
Weight	52.50±4.56	54.40±4.23	1.89	0.95
Age	13.11±0.86	13.18±0.76	0.09	0.26
Training age	2.00±0.80	2.20±0.77	0.19	0.54
Physical tests				
Passing in 10 s	9.50±2.22	9.40±2.75	0.10	0.09
Number circles	21.70±5.12	19.90±6.08	1.80	0.71
Pushed ball from the machine	13.90±2.42	13.60±2.63	0.30	0.26
Passing accuracy from movement	20.40±3.97	19.00±2.86	1.40	0.90
Skill tests				
Spinning hit by forehand	6.40±2.22	5.90±2.02	0.50	0.52
Spinning hit by backhand	6.20±2.25	5.40±2.31	0.80	0.78
Counter-attack after third ball	50.00±14.90	46.50±13.75	3.05	0.54
Super hit by forehand	10.30±2.75	9.10±2.84	1.20	0.96

*The tabulated (T) value at significance level 0.05=1.86. SD: Standard deviation

Table 3: Significance of differences between pre-tests for the control group in physical and skill variables of the study

Variables (N=5)	Mean±SD		F	(T) Value	Improvement %
	Pre-test	Post-test			
Physical tests					
Passing in 10 s	9.40±2.75	11.50±2.32	2.10	1.84	22.34
Number circles	19.90±6.08	17.30±5.92	2.60	0.96	15.02
Pushed ball from the machine	13.60±2.63	16.30±2.58	2.70	2.31	19.85
Passing accuracy from movement	19.00±2.86	21.7±2.35	2.70	2.29	14.21
Skill tests					
Spinning hit by forehand	5.90±2.02	9.20±1.39	3.30	4.24	55.93
Spinning hit by backhand	5.40±2.31	8.30±1.70	2.90	2.18	53.70
Counter-attack after third ball	46.50±13.75	57.00±13.98	10.50	1.69	22.58
Super hit by forehand	9.10±2.84	11.80±2.52	2.70	2.24	29.67

*The tabulated (T) value at significance level 0.05=2.13. SD: Standard deviation

and not using the ball throwing machine with the control group.

Table 4 shows that there are statistically significant differences between pre- and post-tests for the empirical group in physical and skill variables as the counted (T) value was bigger than the tabulated one at significance level 0.05 in all physical and skill tests. Thus, it becomes clear that the proposed training program applied on the empirical group had a positive effect on enhancing all physical and skill variables under study. The researcher attributed this to the proposed training program to develop performance speed using the ball throwing machine.

Table tennis depends on the high ability to respond to overlapping variables during matches which are

provided by the ball throwing machine (Al Dawtaly, 2006. p. 9).

Using the ball throwing machine enhances the skill, physical and planning performance level as a result of focusing on weak points (Anderezej, 1996. p. 15).

Table 5 shows that there are statistically significant differences between pre- and post-tests between both the control and empirical groups in physical and skill variables under study in favor of the empirical group.

Thus, it becomes clear that raising physical and skill levels of the counter-attack for the sample of the study is due to the application of the proposed training program to develop the performance speed variable using the ball throwing machine and determine the

Table 4: Significance of differences between pre-tests for the empirical group in physical and skill variables of the study

Variables (N=5)	Mean±SD		F	(T) Value	Improvement %
	Pre-test	Post-test			
Physical tests					
Passing in10 s	9.50±2.22	14.10±1.66	4.40	9.22	46.31
Number circles	21.7±5.12	13.90±3.44	7.80	9.13	56.11
Pushed ball from the machine	13.9±2.42	24.20±3.19	10.30	28.09	74.10
Passing accuracy from movement	20.40±3.97	26.25±2.67	6.10	9.79	29.90
Skill tests					
Spinning hit by forehand	6.40±2.22	12.30±1.94	5.90	6.00	92.18
Spinning hit by backhand	6.20±2.25	10.00±2.40	3.80	3.64	61.29
Counter-attack after third ball	50.00±14.90	75.00±14.14	25.00	9.85	50.00
Super hit by forehand	10.30±2.57	14.80±2.74	4.50	3.66	43.68

*The tabulated (T) value at significance level 0.05=2.13. SD: Standard deviation

Table 5: Significance of differences between pre-tests for the control and empirical (T) groups in physical and skill variables of the study (N1=N2=5)

Variables	Mean±SD		F	(T) Value	Improvement %
	Pre-test	Post-test			
Physical tests					
Passing in10 s	11.50±2.32	14.10±1.66	2.60	2.87	22.60
Number circles	17.30±5.92	13.90±3.44	3.40	1.86	24.46
Pushed ball from the machine	16.30±2.58	24.20±3.19	7.90	6.08	48.46
Passing accuracy from movement	21.7±2.35	26.25±2.67	4.80	4.25	22.11
Skill tests					
Spinning hit by forehand	9.20±1.39	12.30±1.94	3.10	4.09	33.69
Spinning hit by backhand	8.30±1.70	10.00±2.40	1.70	1.87	20.48
Counter-attack after third ball	57.00±13.98	75.00±14.14	18.00	2.86	31.57
Super hit by forehand	11.80±2.52	14.80±2.74	3.00	2.41	25.42

*The tabulated (T) value at significance level 0.05=1.86. SD: Standard deviation

effect of the training program on the counter-attack skill for members of the study sample.

Evaluating table tennis players should be made in fitness and psychomotor evaluation. It includes performance speed, response speed and motor performance speed (Misins, 2003. p. 31).

Physical preparation is the applied process to raise the training condition's level of players by giving them fitness which, in turn, affects the skill and planning aspects. Practicing exercises that develop components of fitness is accompanied with a rising in performance level for different basic skills of the practiced activity as well as raising the planning performance level (Jamal and Abdelhalim, 2005. p. 232).

CONCLUSIONS

1. Using the ball throwing machine helps the player to train by himself with saving time and effort during the training process
2. The proposed training program has a positive and effective influence on developing performance speed for members of the empirical group of the study
3. The training programs using the ball throwing machine help treating weak points of players, enhancing, and fixing strength points.

RECOMMENDATIONS

1. Consideration of training on the counter-attack skill regularly in addition to attacking and defense skills
2. The ability to use the ball throwing machine as effective means to evaluate skill performance for its reliability, validity, and objectivity
3. Working on spreading assistant tools and appliances in table tennis at the level of teams, youth centers and faculties of physical education.

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The Effect of Anaerobic Training on Cardio-respiratory Endurance, Muscular Endurance and Agility in Fitness Female Practitioners 40-45 Years Old

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ABSTRACT

Health is one of the main priorities for individuals. Health cannot be present unless with fitness. If humans lose their fitness, they shall lose the most important factor of health and happiness as these are the pillars of his existence and survival, so they have to exert efforts to restore them, perform their roles, and enjoy their existence and private lives. Therefore, the researcher decided to prepare a legalized training course consistent with the sample of the study of women who aim to obtain good health fitness which means the general health of individuals at first before considering other aspects. The researcher hopes that this work is a scientific simple addition. Hence, to understand the fact of women's bodies and resistance to internal environmental conditions came the research problem, which is studying what happens to a women's body during exposure to effort with different intensities to be subject to the anaerobic system and their effect of cardio-respiratory and muscular endurance with fitness practices of age 40-45 years old, and thus the return of good health to the practice of sport activity. The study aimed to identify the impact of the training curriculum, anaerobic cardio-respiratory, muscular endurance, and agility in a sample of the study. The researcher used the empirical method as it helps to solve the problem of the study and selected a sample of 10 female fitness practitioners and aged 40-45 years using the purposive method. The researcher concluded that anaerobic training has an effect on the research variables in post-tests more than pre-tests with different proportions. In addition, cardio-respiratory endurance is important to reduce fatigue through body adaptation after physical effort. Moreover, muscular endurance is affected by physical effort as well as agility according to training's intensity, consistency, and duration requirements. The researcher recommended that sample of the study had to be subject to continuous examinations at the response to determine short- and long-term effects with continuous and periodical medical follow-up to ensure functionality of vital systems.

Keywords: Anaerobic training, cardio-respiratory endurance, muscular endurance, agility, fitness

INTRODUCTION AND SIGNIFICANCE OF THE STUDY

Sport medicine physiology is one of the main and necessary sciences for workers in sports field. It is

the science that brings development in the level of physical performance as a result of the physiological effects of training through which adaptation of various systems of the body comes to the level of that training. Knowing that scientists, researchers, and trainers are still striving and exert effort to reach facts and studies that help the training process to develop the capacity of systems, tissues, and functional cells of the body to reach high-level sports achievements as well as the development of public health practitioners' activity. Accordingly, science and scientists throughout ages have provided humanitarian service to address a

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number of diseases, which have been caused in the most ages due to lack of physical effort, whether walking types, running, jogging or swimming, and other. Yet, with the attention of scientists and researchers of the importance of health for humans, societal culture has become important to explain causes of diseases, eating healthy food, and identifying meals per day. They affected all members of society in changing their convictions toward the direction of practicing sport activity, which played an important role in the modern era.

We all know that women in general and women in our society, in particular, are more likely to face such unhealthy phenomena because of lack of physical activity, increasing functionality and sitting on offices. This encourages women to have foods that are loaded with high calories. Thus, they may suffer from obesity and degrading fitness which is also encouraged by the nature of society, nature of eaten foods, and not practicing any physical activity (Rowland, 1996: p. 1).

Speaking about type of training or physical effort for ½ h and three training units from oxygenic view, it was studied but with specific types in addition to not inclusion of high and low-intensity interval training depending on oxygenic and non-oxygenic system. Hence, to set correct solutions of using different types of anaerobic training systems, the study significance came in the need to determine the effect of physical training based on the anaerobic system provided in different testing periods on cardio-respiratory endurance, muscular endurance, and agility for fitness practices for ages 40-45 years.

Problem of the Study

Health is one of the main priorities for individuals. Health cannot be present unless with fitness. If humans lose their fitness, they shall lose the most important factor of health and happiness as these are the pillars of his existence and survival, so they have to exert efforts to restore them, perform their roles, and enjoy their existence and private lives. Therefore, the researcher decided to prepare a legalized training course consistent with the sample of the study of women who aim to obtain good health fitness which means the general health of individuals at first before considering other aspects. The researcher hopes that this work is a scientific simple addition. Hence, to understand the fact of women's bodies and resistance

to internal environmental conditions came the research problem, which is studying what happens to a women's body during exposure to effort with different intensities to be subject to the anaerobic system and their effect of cardio-respiratory and muscular endurance with fitness practices of age 40-45 years old, and thus the return of good health to the practice of sport activity.

Objectives of the Study

1. Setting a training program including anaerobic training for the sample of the study
2. Determining the effect of the anaerobic training program on cardio-respiratory endurance, muscular endurance, and agility for the sample of the study.

METHODOLOGY

The researcher used the empirical method as it helps to solve problem of the study "attempting to adjust the main factors affecting the change of dependent variables in the trial except for one factor controlled by the researcher and changed in a certain manner to determine its effect and measurement in dependent variable(s) (Mahgoub, 2001: p. 7)."

Sample of the Study

The researcher selected a sample from the original population of 10 female fitness practitioners and aged 40-45 years using the purposive method in a single empirical group, and the remaining two of the sample were subject to exploratory study through anaerobic training. To determine sample homogeneity, the researcher extracted skewness coefficient for the selected sample (under study) to make the main trial in high accuracy. The researcher extracted skewness coefficient for length, weight, and age after extracting arithmetic mean, median, and standard deviation for each item. Results showed sample homogeneity because it was between ± 3 as shown in Table 1.

Table 1: Sample properties, statistical features, and sample homogeneity values

Tests	Mean±SD	Median	Skewness value
Weight (kg)	84.12±10.09	82.5	1.023
Total body length (cm)	161.25±3.59	160	0.119
Age (year)	38±8.82	38	2.867

SD: Standard deviation

Field Procedures of the Study

Determining tests of the study

Through reference research and consulting the supervisor, the following tests were adopted:

- Cardio-respiratory endurance test (Radwan, 1988: p. 6)
- Muscular endurance test for abdomen muscles (Al Jameeli, 1983: p. 2)
- Fitness-shuttle run test 104 m × 40 m (Ali, 1999: p. 5).

Pre-tests

Pre-tests were conducted on the sample of the study (10 females) at 10 am on Sunday, 09/11/2015. The researcher applied muscular endurance test and endurance test for arm muscles with the same consistent variables in tests (time, place, devices, tools, and assistant team) in post-tests.

The Training Program

The empirical group was subject to items of the training program prepared by the researcher in a period of 4-month starting from 11/11/2015 to 21/02/2016. Training rate in a single week was three training units for the following days: Saturday, Monday, and Wednesday.

First - Objectives: The researcher's training course

- 1st month includes general preparation of fitness development for the sample of the study of the empirical group
- The group was subject to training period of 3-month, in which the training group was trained through the anaerobic system.

Second - Training methods

The most significant characteristic in training is the use of suitable methods to achieve objectives of its items. The researcher used the circulatory training through less intensity interval method. Training intensity ranged between 35% and 70% in general preparation exercises. In anaerobic system exercises, the researcher used high-intensity training ranged between 80% and 95% of practice.

Third - Components and items of the training program

Items of the course included a set of exercises that contributed to develop the physical and functional potential in general in the 1st month and then 3 months

of training the group using anaerobic training system. Items of the course included the following:

- The training course's limit is 4 months
- Total course limit id is 16 weeks
- Number of training units per week is 3 units
- Training days: Saturday, Monday, and Wednesday
- Number of training units in the course is 48 units
- Time period in preparation section is 10 min
- Time period of aerobic training in the single unit is 45 min
- Time period of anaerobic training in the single unit is 45 min
- Final section time duration is 5 min
- Duration of the single training unit is 60 min
- Total time period of training units within 4 months is 2880 min
- Total time period in preparation section is 480 min
- Total time period in main section is 2160 min
- Total time period in final section is 240 min.

The researcher conducted sample observation during implementation of the training course in terms of any overload that may cause fatigue which may lead to stop the training course implementation.

Post-tests

Post-tests were conducted on the sample of the study on February 24, 2016, with the same sequence as pre-tests. The researcher committed to follow the same method in pre-tests and provided the same conditions and requirements including time, place, work team, assistant team, and the applied method in tests.

DISCUSSING AND ANALYZING RESULTS

Presenting and Analyzing Results of Pre- and Post-tests for the Sample

Table 2 shows results of pre- and post-tests for the sample of the study in health fitness component tests using the *t*-test for symmetric samples.

From results of Table 2, we can find that there is a notable development showing the effectiveness of the training course in general with low and medium intensity exercises in developing cardio-respiratory endurance for the sample. References show that the cardio-respiratory system training works in big muscles which lead to consume amounts of oxygen more than speed training. This agrees with Ahmed (1999: p. 3), who refers that "functional effect through continuous load method is working on raising functional work of the heart, circulatory system,

Table 2: Results of pre- and post-tests for the sample of the study in health fitness at significance level (0.05) and freedom degree (19)

Features	Variables	Measure unit	Mean±SD		Counted T	Error level	Significance
			Pre-tests	Post-tests			
Cardio-respiratory endurance	Cooper's test	Meter	1300±2.256	1458±2.20	4.387	0.00	Significant
Muscular endurance	Sitting from lying	Repetition	16.916±5.16	23.75±5.479	12.792	0.00	Significant
Agility	Shuttle run test		15.09±0.607	14.87±0.796	0.911	0.001	Significant

SD: Standard deviation

and respiratory system, organizing oxygenic exchange process, increasing the ability of blood on carrying the biggest amount of oxygen and necessary fuel to continue exerting effort, and then increasing cardio-respiratory loads as happened with the sample of the study.”

The researcher noticed that there were statistically significant differences in terms of results of muscular endurance test results between pre- and post-tests in favor of post-test. The researcher attributes this to continuous aerobic training that develops general endurance, especially if there is optimal period to make ability through the use of muscular system with the circulatory system which leads to muscular endurance. This was approved in the researcher’s course.

Through enhancing the function of the circulatory system and increasing blood’s ability to carry bigger amount of oxygen and necessary fuel to continue exerting effort at aerobics, continuous training develops oxygenic ability which works on “enhancing muscular work that depends mainly on oxygen in producing anaerobic energy for a long period before feeling fatigue (Abdel-Fattah, 1998: p. 1).” As for agility, the researcher found that the development in results was attributed to the used training. This agrees with Hossam et al. (2000: 4) as “The most important thing that can be achieved by these types of exercises is to improve the level of balance and agility being the basic physical components in many sporting activities. Concerning agility, it is known that flexibility works on the consistency of allowing free movement as well as to increasing synergy either in performance and agility.”

CONCLUSIONS

- Anaerobic training has an effect on variables of the study more in post-tests than in pre-tests

- Cardio-respiratory endurance is important to reduce fatigue through body adaptation after physical effort
- Muscular load is affected by physical effort and according to intensity requirements, consistency, and period of training
- Agility is affected by physical effort under study.

Recommendations

Through the researcher’s trial and findings, the following are her recommendations:

- The sample of the study shall be subject to continuous investigations at response to determine short- and long-term effects
- Continuous and periodic medical follow-up to check vital systems of the body
- It is important to practice physical effort in enhancing general health and body systems
- Conduct similar studies but with different ages
- Conducting studies using functional topics that agree with the idea of the study.

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Annex 1

Model of the main training unit for general preparation

Month:	First	Date:	19/10/2015	Unit duration:	45 min
Week:	(1)	Unit:	(1)	Unit objective:	Developing cardio-respiratory system
Exercises	Intensity %	Repetition	Break between exercises	Number of groups	Break between groups
10, 11, 12, 22	40	20	1 min	3	3 min
13, 14, 15	45	15	1 min	3	3 min
7, 8, 9	45	15	1 min	3	3 min
16, 17, 18	40	15	1 min	3	3 min
21, 23, 24, 30	45	20	1 min	3	3 min
32, 40, 35, 63, 64	40	25	1 min	3	3 min

Annex 2

Model of the main training unit for general preparation

Month:	Second	Date:	07/12/2015	Unit duration:	45 min
Week:	(4)	Unit:	(1)	Unit objective:	Developing maximum and under maximum strength
Exercises	Intensity %	Break between exercises	Number of groups	Break between groups	
74, 75, 66, 67	80	1 min	2	3 min	
70, 71, 72	85	1 min	2	3 min	
3	90	30 s	-	1 min	
4	95	30 s	-	1 min	
73, 66, 78	85	1 min	2	3 min	
65, 56	90	1 min	2	3 min	

Annex 3

Exercises used in training

1. Running on speed 5
2. Jogging on speed 5
3. Running on speed 7
4. Jogging on speed 7
5. Hand push on the multi-training device
6. Feet push on the multi-training device
7. Feet push on the multi-training device consecutively with each leg separately
8. Push by right and feet on the multi-training device
9. Abdomen training on the multi-training device from lying position
10. Dash in place with raising arms alternatively
11. Dash in place with cross arms upward
12. Steps forward with raising heels at walking
13. Side lying – legs bent, open upward and side bent
14. Side lying – lower legs stretched, higher legs bent on the ground and legs open upward
15. Side lying – legs stretched and legs open upward
16. Lying on the back – legs and arms bent behind head and raise head upward
17. Lying on the back – legs bent and putting the other leg on the knee from motor and back elbow
18. Lying on the back – bent legs and thigh rising upward

19. Leaning on four and thigh rising upward
20. Leaning on four and thigh lowering downward
21. Bending trunks forward in long sitting
22. Side spreading arms – opening and closing legs by jumping on two sides
23. Stretching leg forward and raising arms upward alternatively
24. Bending and stretching legs with trunks press downward and stretch upward
25. Dash in place with cross arms upward – downward with inclined trunks
26. Dash in place with side rotation of arms
27. Forward and other side steps with two backward jumps
28. Standing with side stretching arms – side opening and closing of legs
29. Bending legs and arms from elbows before the body with opening and closing in two right and left steps
30. Forward physical training
31. Sitting on a chair and raising legs upward
32. Standing with a stick behind head and side trunks
33. Side lying – bending legs while opened upward
34. Side lying – stretched legs, bending, and stretching and then opened upward
35. Back lying – bending leg, putting the other leg on knee, and touch elbow by the opposed leg's knee
36. Inclined lying with head on legs bent below and trunks bent forward
37. Lying on abdomen – raising thigh off the ground
38. Lying on the back – raising thigh off the ground
39. Lying on abdomen – arms behind head and raising head upward
40. Jumping with hitting thigh by heels
41. Jumping with spreading trunks and stretching elbow backward
42. Forward and side and the other side, steps with bent legs and two jumps backward
43. Standing with side spread arms – side opening and closing legs by jumping
44. Position of sitting on a chair with raised legs
45. Standing with stretching legs upward and raising arms upward alternatively
46. Standing, bending, and stretching legs with downward trunks press and upward stretch
47. Physical training with raised weight
48. Side bending trunks with raised weight by one hand
49. Lying on the back, raised legs, upward and downward
50. Inclined lying, head below, legs upward, trunks bend and stretch
51. Standing with stretched waist, trunks bending on both sides alternatively
52. Lying on abdomen, raising arms, and legs upward
53. Sitting and carrying a stick behind head, bending trunks on both sides
54. Sitting with opening right hand overhead and bent left hand on chest, trunks bent on both sides alternatively
55. Side lying – raised legs, lowering lower leg
56. Side lying – bent legs, opening legs upward while being bent
57. Standing with open legs, stretched arms, carrying weights and side inclination
58. Standing and carrying a weight with one hand while side trunks bending
59. Lying on the back with bicycle movement
60. Lying on the back, raising and lowering legs.

The Effect of Using (Carbohydrates) Diet Program Accompanied by Aerobics in Obesity Treatment

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ABSTRACT

This study aims to prepare the (carbohydrates) diet program and aerobics exercises consistent with the sample of the study and determining the relation of the (carbohydrates) diet program and aerobics in obesity treatment for the sample of the study. The researchers used the empirical method with a single group. The sample was selected purposively in women who are suffering from obesity and visit Hawa'a Center for Agility with weighs between 75 and 120 kg (10 women with ages between 25 and 35 years old). The researchers set two nutrition and sport programs. In the first program, the (carbohydrates) diet program was applied for 9 weeks including 3 weeks without practicing sport until weights are reduced 10 kg. After that, aerobics exercises are used with diet for 6 weeks. In the light of results reached by the researchers, it was concluded that the (carbohydrates) diet system affected directly the weight loss in addition to aerobics exercises through reducing fats in various areas of the body as there were significant differences in favor of post-test.

Keywords: Diet programs, carbohydrates, aerobics, obesity

INTRODUCTION

Obesity, from which many are suffering, is usually due to lack of nutritional health awareness, increasing food amounts, bad selection of food sorts, and lack of movement and effort. We eat more than our bodies need and move a little. Therefore, the body stores over energy resulting from foods in the form of lipids accumulating in various parts of the body.

Obesity is a medical term that always happened when a man's weight is over his normal weight limit notably with an increase in fats formation in various parts if

the body (David et al., 1994: p. 492). Obesity can be defined as an increase in fats in a normal amount in terms of age, gender, body pattern, and length. Obesity is a case of over fat and not only overweight (Faraj, 2009: p. 283).

Causes of obesity can be summed up as follows: Too much food that contains large amounts of sugars and fats, a lack of movement, psychological problems, and some diseases related to hormonal imbalance, poor feeding habits in childhood, genetic obesity, increased appetite, excessive food, and poor metabolism.

For the purpose of obesity treatment, diet and sport exercises must be adhered to as carbohydrate diet is one of the systems that rely on the application of a low-calorie diet regime. The (carbohydrates) diet relies on calorie-rich foods of complex carbohydrate quality because complex carbohydrates have advantage of being rich in fibers and need more time to digest, so they make you feel satiety for a

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long time. They are rich in nutritious substances and nutrition fibers, lead to a relatively slow rise in blood sugar level and release little insulin from complex carbohydrates foods such as oats, brown bread, brown rice, and beans of all types where these foods with a high energy content, which is an important element for the body and, at the same time, protect against the accumulation of fat and unexplained weight gain. Diet carbohydrates, as a daily system, offers large shares of protein, vegetables, and reduces carbohydrate intake to as little as possible which makes few amounts of calories provided to the body forcing the body to burn its stock of fat to make up the shortfall in calories and increase metabolism rate by the increase of providing proteins.

Aerobic exercises are among the popular exercises in clubs, agility gyms and weight loss for women. They are sport movements performed on a musical rhythm similar to dancing. The word (Aero) is of a Greek origin and it means (Air) while (Bic) means (Life) as man needs oxygen in the air all the time to manufacture energy and to stay alive (Hemdan and Abdelrazek, 2001: p. 56).

These exercises are regular sequential movements with a musical rhythm. The movements are jumping, hopping, limb movement, muscle tension, and extension that are performed with a musical rhythm. In recent years, these have become a form of highly popular aerobic exercises characterized by great appeal, especially for women, because of the nature of their performance with music and fun provided in the course of practice (Assi, 2000: p. 6). Hence, the significance of the study is an experimental attempt for obesity treatment which is a disease suffered by many women through carbohydrate diet and aerobics together.

Objectives of the Study

1. Preparing the (carbohydrates) diet program and aerobics consistent with the sample of the study.
2. Determining the relation of the (carbohydrates) diet program and aerobics in obesity treatment for the sample of the study.

Hypothesis of the Study

There are statistically significant differences in the relation between the (carbohydrates) diet program and aerobics in obesity treatment for the sample of the study.

METHODOLOGY

The researchers adopted the empirical method with a single group as it is appropriate to the nature of the study.

Sample of the Study

The sample was selected purposively in women who are suffering from obesity and visit Hawa'a Center for Agility with weighs between 75 and 120 kg (10 women with ages between 25 and 35 years old).

Tests of the Study

1. Body mass index which is the proportion of weight (kg) to length (m^2) through which we can determine the percentage of accumulated lipids in the body (Durr, 1999: p. 17).
2. Lipid components measurement using the calipers device (Yassin and Taha, 1986: p. 334). It measures the following parts:
 - a. Lipid components in shoulder plate
 - b. Lipid components in the biceps brachii muscle
 - c. Lipid components in the triceps brachii muscle
 - d. Lipid components in the waist
 - e. Lipid components in the abdomen
 - f. Lipid components in the thigh.

Exploratory Trial

The exploratory study was performed on a sample consisting of 4 women among the original sample of the study to overcome impediments that may face the researchers if they ensure correct tools, how consistent the prepared method is and efficiency of the assistant team. Tests were conducted on 07/02/2016 corresponding Sunday in Hawa'a Center of Women's Agility at 2 pm.

Pre-tests

Appropriate measurements to the sample of the study were made on 11/02/2016 at 2 pm in Hawa'a Center for Agility.

Main Trial

The main trial began on Monday, 15/02/2016, where researchers deliberately put two programs, one of them is a diet program and the second was an athletic one. In the first program, they set the (carbohydrates) diet

for 9 weeks including 3 weeks without exercise until the weight loss of 10 kg. After that, aerobic exercises were performed with diet for 6 weeks. Instructions of the diet should be complied with as follows: You can delete anything from the diet without any compensation, you can eat vegetables at any time and with any amount except for (carrots), use salt in very small amounts, fat forbidden, forbidden fruit are: (Bananas, mangoes, dates, apricots, grapes), you are allowed to drink coffee and tea without sugar, but you must drink (8-12) water glasses daily.

The (carbohydrates) diet model:

Week 1	Week 2	Week 3	Week 4	Week 5
Saturday	Sunday	Monday	Tuesday	Wednesday
Breakfast: Fat-free milk+small spoon of honey+ 2 toast slices+white cheese+½ orange juice cup	Breakfast: 2 toast slices+fresh juice +vegetables	Breakfast: 2 toast slices +a small spoon of yogurt+ tea or fat-free milk	Breakfast: Fat-free milk+ a small spoon of honey+ one toast slice+yogurt	Breakfast: Fat-free milk+ fresh juice+ one toast slice+yogurt spoon
Lunch: Oil-free salad+grilled chicken breast+½ toast slice	Lunch: Macaroni +tomato sauce+fresh salad with apple vinegar	Lunch: A piece of steak+ boiled vegetables	Lunch: Fresh salad+ a piece of boiled or grilled chicken+1 slice of toast	Lunch: Cup of boiled rice+ cup of milk
Dinner: Vegetable soup+2 toast slices+ yogurt+ two types of fruits	Dinner: Fresh juice or fat-free milk+ 2 toasts with white cheese+ an apple	Dinner: 2 toasts with white cheese+ cucumbers+ two types of fruits	Dinner: Fat-free milk+ 1 toast+one spoon of yogurt+two types of fruits	Dinner: Fat-free milk+ a boiled egg+ 2 toasts+2 fruits
Week 6	Week 7	Week 8	Week 9	
Thursday	Friday	Saturday	Sunday	
Breakfast: Fat-free milk+ one toast+ one boiled egg or white cheese	Breakfast: Fresh orange juice+one spoon of honey +2 toast slices+yogurt	Breakfast: Tea and fat-free milk+2 toast slices+yogurt spoon	Breakfast: Grape fruit juice+2 toast slices+yogurt	
Lunch: Fresh salad+ vegetable soup+ 1 toast	Lunch: Vegetable salad+a piece of grilled steak+a toast	Lunch: Oil-free tuna salad 1 toast	Lunch: One omelette egg, ½ spoon of vegetable oil+1 toast	
Dinner: Lettuce salad with white cheese+ 2 toasts+an orange	Dinner: Boiled potatoes+ orange juice	Dinner: Fruit salad+fresh orange juice	Dinner: Milk with cucumber salad+one type of fruit	

In their program application, the researchers considered the following basics:

The program started on Monday (07/03/2016) corresponding Thursday at 10 am. The aerobic program lasted for 6 weeks in 5 training units a week and days from Sunday to Thursday. The number of training units for the program was 30 training units. The researchers also depended on grading in intensity. Since the sample consists of beginners, the program began with an intensity of 45% of maximum repetition. Intensity increases from the first until the 6th week to reach 70%. The program contains some various movements that suit the trainees' abilities in this age category. This is because aerobics are characterized with variability in training, so the sample did not feel bored with continuous performance accompanied with music. The total duration of the single training unit is 40-60 min including the period of warm-up and relaxation.

Post-test

Measurements were made on Sunday 17/04/2016 at the same conditions of the pre-test.

Statistical Means

The researchers used the Statistical Package for the Social Sciences program and calculated arithmetic mean, standard deviation (SD) and Wilcoxon value automatically.

Findings

Table 1 shows that the arithmetic mean of weight variable in pre-test was 87.59 with an SD of 11.93 and in post-test was 75.48 with an SD of 17.41. Average ranks were 5.5, total ranks of 55, counted Wilcoxon value of 2.8 with a possible value of error percentage of 0.005 which are less than the counted one, so there are statistically significant differences in favor of post-test. The sample was presented on all studied variables and found that they are all have statistically significant differences in favor of post-test.

DISCUSSING RESULTS

Through Table 1, the study found that results of Table 1, it was found that results of anthropometric measurements and tests in pre- and post-tests of body weight, mass, lipids in shoulder plate, lipids in biceps, triceps, waist, abdomen, and thigh showed

Table 1: Arithmetic means, SD and Wilcoxon value for pre- and post-tests of variables of the sample of study

Statistical variables	Measurements	Mean		SD		Rank average	Total ranks	Wilcoxon value	Possible value	Significance
		Pre-	Post-	Pre-	Post-					
Weight	Kg	87.59	75.48	11.93	17.41	5.5	55	2.8	0.005	Significant
BMR	m/kg	24.12	21.11	3.1	2.3	5.5	55	2.8	0.005	Significant
Lipid components in shoulder plate	Mm	22.93	20.58	5.94	6.74	5.11	46	1.8	0.059	Significant
Lipid components in biceps	Mm	21.44	18.01	3.55	3.81	5.5	55	2.8	0.005	Significant
Lipid components in triceps	Mm	25.04	21.16	5.04	4.9	5.5	55	2.8	0.005	Significant
Lipid components in waist	Mm	25.77	22.38	5.66	5.61	5.5	55	2.8	0.005	Significant
Lipid components in abdomen	Mm	29.71	25.08	5.02	4.16	5.5	55	2.8	0.005	Significant
Lipid components in thigh	Mm	30.68	27.84	6.3	6.47	5.5	55	2.8	0.005	Significant

SD: Standard deviation

statistically significant differences in favor of post-test. The researchers attribute this reduction in lipids to consumption of lipid components as a result of requirements of the adopted physical methodology and intensity between 50 and 70% which shows domination of aerobic power system on total adopted method and diet. In addition, the sample adhered to performance with regular nutrition along trial period was a cause of reducing lipid components present. Regularly practiced oxygenic exercises for the long period increase power consumption which leads to reduce lipid percentage in the body (Bob et al., 2000: p. 108).

The results of fat weight measurement and weight variable also showed that there is a significant difference between pre- and post-tests in favor of post-test. The researcher attributes the differences to the nature of physical method and its included exercises with low-intensity physical activity which led to reduce lipids as a result of the nature of the energy system working based on these exercises. These exercises led to reduce their weight in a way that enables the trainee to consume a great number of calories originated from materials stored in the body, especially fats beneath the skin with adherence to the low-calories carbohydrate diet which was referred to by Valerie as oxygenic exercises may be a means to enhance metabolism ability, calories balance and control the amount of body lipids (Valerie, 1988: p. 138) in addition to Qaba, 1989: p. 22 who asserted this too.

Abo El Ela and Mohamed Sobhy assert that one of the prevailing misconceptions is that physical activity increases the appetite to eat, as recent research results have shown that exercise, particularly exercise with light or moderate intensity that requires continuing relatively long periods of time, do not increase appetite but probably diminish them because of the increase of digestive hormones that accompany the exercises (Abo El Ela and Mohamed Sobhy, 1997).

Having a consistent body is due to consistent aerobic training which starts by obtaining the energy source from lipids of the most storing places to less ones, so anthropometric measurements are affected accordingly. Many specialists tried to deal with positive effects of physical exercise, especially these characterized using wind energy, especially these using aerobic energy for a relatively long period of time with analysis and study to determine all of these effects, their effectiveness and effect on anthropometric (physical) measurements, physiological (all inside body systems) measurements, and exercises which affect all previously mentioned variables (Weineckij, 1983: p. 146).

The studies also agreed that the process of balancing calories balance process used in any physical activity with calories through eating will help in weight loss. Moreover, physical training is considered a helping factor on controlling weight as a result of calories consumption till they remained stored as we find that the person became fat (Assi, 2000: p. 124).

Furthermore, regularly practiced aerobics increase power consumption which leads to reduce lipids value in the body (Bob et al., 2000: p. 108). Studies refer that: "Weight loss or gain relative to these optimal weights in tables of weight and length may be due to increase in muscle mass and decrease in lipids less than the required limit," (William, 1985: p. 112).

CONCLUSION

In the light of study findings by the researchers, it was found that the (carbohydrates) diet has a direct effect on weight loss with participation in aerobics through reducing lipids in various areas of the body. There were significant differences in favor of post-test. As for the most significant recommendations, the study recommends adoption of suitable and integrated nutrition diet such as the (carbohydrates) diet that does not affect individual's health in keeping optimal weight and the necessity to adopt low-intensity physical activity with oxygenic power to get rid of over fats that are more than natural rate of body weight.

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The Effect of using Various Exercises using Rubber Resistances Accompanying some Visual Means and Vision Training in Developing Scoring Accuracy in Football

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ABSTRACT

Scoring accuracy is one of the main factors for any team to win. Any weakness is considered a problem for training officials. This problem should be overcome. Through the researchers' experience in training, practicing the game and continuous follow-up of the tournament, they noticed that many players lack scoring accuracy which is considered by the researchers as a real problem sought to be solved through setting a training course using various exercises and determine its effect on developing scoring accuracy in football. In the light of results of the study, the researchers found that all exercises affect developing scoring accuracy in football, regular exercises and vision exercises by the second group are better in developing scoring accuracy in football, and there is a significant difference between pre- and post-tests for all groups and in favor of post-test. Through conclusions, the researchers recommend adoption of regular training and vision training in developing scoring accuracy in football, it is necessary to increase scoring during various training periods due to its positive effect on mastering scoring, it is also necessary to conduct scientific studies and researches in using regular training and vision training to reach the best achievement through developing all basic football skills.

Keywords: Various training, rubber resistance, visual means, vision exercises, scoring accuracy, football

INTRODUCTION AND SIGNIFICANCE OF THE STUDY

Football is characterized by a special nature that is different from the other ball games in terms of other ball games and other course, in terms of the way of technical and tactical performance, the way of the goal is counted as well as the pace of great speed in performance

encouraged by rules of the game. This leads to a high level of excitement especially during the implementation of high-level demands of the game. It is among these requirements that can be developed and upgraded through the use of various methods and techniques of training. Through this diversity training process, we reach the goal of sports training we seek, which is to reach high levels in the way of scoring goals, high precision, and speed. In addition, football includes multiple basic skills in defense and attack, the separating line between winning and losing is scoring, and the main objective, which culminates performance in the game of football, is scoring accuracy as the team can win the game through scoring more goals of the opposing team at the end of the game's time. Hence, the significance of the study lies in the scientific serious attempt that researchers want to try

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using a variety of exercises for the purpose of achieving broader goals in sport training. It is a study which the researchers hope to serve the game of football.

Problem of the Study

Scoring accuracy is one of the main factors for any team to win. Any weakness is considered a problem for trainers as they should be working on overcoming this problem. Through the experience of researchers in training, practicing the game and continuous follow-up of the tournament, they noticed that many players lack scoring accuracy which is considered by the researchers as a real problem sought to be solved through setting a training course using various exercises and determine its effect on developing scoring accuracy in football.

Objectives of the Study

The study aims to:

1. Design an educational course using various exercises to develop scoring accuracy in football.
2. Comparing priority of various exercises in developing scoring accuracy in football for members of the study.

Hypotheses of the Study

1. There are statistically significant differences between pre- and post-tests in developing scoring accuracy in football for members of the study.
2. There are statistically significant differences between post-tests for the three various exercises.

METHODOLOGY

Methodology is one of the important and basic elements in conducting scientific researches. Accordingly, the researchers used the empirical method using three symmetric groups as it is proper to the nature of the research problem.

Sample of the Study

The researcher selected junior players of Electric Industries Football Club. A number of the study population individuals were 36 players divided into three groups. Each group consisted of 12 players. The researcher applied rubber resistance exercises on the first group while regular training and vision training were applied on the second and the third group using visual means.

Scoring accuracy test in football (Zaid, 2013: p. 781).

Pre-tests

Pre-tests for the sample of the study and for the three groups were conducted in a single day on 06/09/2015. Testing results were recorded based on the following methods: Rubber resistance, regular training, vision training, and some visual means with consideration of all conditions related to tests including time, place, and tools.

Training Course

After the researcher selected the sample, it was divided into three equal groups. Each group works with a certain method under study. Rubber resistance training was applied on the first group while regular training and vision training were used with the second group. The third group applied visual means. The researchers applied the course represented in 8 weeks with three training units per week (Saturday, Monday, and Wednesday), where the number of training units reached 24 units, and both researchers intended to make the diversified duration of exercise with rubber bands in the module of 30-40 min of preparatory section and then strongly graduation exercises in the modules by changing band type based on severity or numbers. Tests were under the supervision of the researchers and the team's coaches.

Post-tests

After implementing the training course on the sample of the study, post-tests were applied in a single day on 07/11/2015.

PRESENTING AND DISCUSSING RESULTS

Presenting and Discussing Results of Pre- and Post-tests

Table 1 shows that the counted (T) value for the first group reached (3.05) which is higher than tabulated value of 2.36 at freedom degree of 11 and significance level of 0.05. It shows that there is a significant difference between pre- and post-tests in favor of post-tests. The researchers attribute this development to the effect of resisting rubber bands that helped players to be distinctive at scoring accuracy variables through the increase of muscular strength by the effect of resistance during training. This agrees with the view that "the use of the style of disability (resistance) leads

to the development of the force or its compounds, while the calculated (t) value for the second group was 3.84 and is also higher than the tabulated value of 2.36 at the same degree of freedom, the same level of significance with significant difference and in favor of post-tests.” The researchers attribute emergence of such differences to the use and adoption of regular exercise and training vision that effectively influence the development of scoring accuracy that should be considered and exercised. This also corresponds to Nagah Mahdi who said that “visual exercises are very important for players in various sporting events as they develop motor correspondence” (Mahdi, 2011: p. 249), as it should be practiced without exception, especially eye exercises. This is to overcome visual stress, which negatively affects the functions of vision with the passage of time. Moreover, the researchers believe that the use of visual exercise significantly contributes to the development of optical capacities because the sense of sight plays an important role in performing special skills especially the scoring skill with the presence of a barrier to block vision. As for the third group, the calculated value of (t) 3.96 which is higher than the tabulated value of 2.36 at freedom degree of 11 and significance level of 0.05, this shows that there is a significant difference in favor of post-tests for the sample of the study through the method which refers that using visual means represented in various educational means in education (static pictures, sequenced pictures, and silent movies) makes motor education more effective and positive. They make the learner responsible, participant and positive to a great extent. The use of these means leads to push education forward, reduce time period and

work on building and developing individuals (Ayoub et al., 2004-2005: p. 38).

Table 2 shows that the counted (F) value is 22.067 which is bigger than the tabulated one which reached (3.40) at freedom degree of 2.33 and significance level of 0.05. This shows that there are no significant differences among the three groups of the study sample that used three different training methods leading to positive results.

Table 3 shows that the value of differences in arithmetic means between first and second group is 13.755 which is bigger than least significant difference (LSD) value of 5.458. This shows that there are significant differences in favor of the second group (group of regular training and vision training). The researchers attribute this to the player’s ability on applying the game’s strategy based on visual information. It is called previous visual experience as visual training works on improving basic visual capabilities through repeated series of eye exercises work. This is important for all athletes. Therefore, trainers and specialists should grow and develop sensory perception of vision depth of players during training. The more this strength is advanced, the bigger and better the ability to act in various situations of play (Mahjoub, 2002: p. 191) and that the differences value of the circles in arithmetic means between the first and the third group is (-11.847) which is less than the value of LSD of 5.458. This shows that there are no differences between the first and the third group.

On the other hand, the value of differences in means between the second and the third group is 1.881 which

Table 1: Arithmetic means, SDs, the counted and tabulated T-values for the three goals and for all variables in pre- and post-tests

Groups	Measure unit	Pre-test (scoring)				Counted T-value	Tabulated T-value	Significance
		Mean	SD	Mean	SD			
First group	Degree	3.5	1.01	6.37	1.4	3.05	2.36	Significant
Second group		4.44	1.03	7.21	1.8	3.84		Significant
Third group		4.37	1.4	5.5	1.6	3.96		Significant

SD: Standard deviation

Table 2: Analysis of variance, counted and tabulated (T) values for post-tests of the achievement of the three educational groups

Source of variance	Total squares	Freedom degrees	Average squares (variance)	(F) Value		Significance
				Counted	Tabulated	
Inter-groups	111.94	2	55.47	22.067	3.40	Significant
Intra-groups	60.208	3	25.217			

Table 3: Differences value among arithmetic means of achievement test and the least significant difference LSD for the three groups of the study

Groups	Arithmetic means	Differences	LSD Value	In favor of
First group- Second group	69.999-56.244	13.755	5.458	Second group
First group- Third group	68.118-56.244	-11.847	-	-
Second group- Third group	68.118-69.999	1.881	-	Second group

LSD: Least significant difference

is less than the value of LSD of 5.458, and this shows that there are no differences between the two groups. Hence, we conclude that the second group is the one that showed differences in scoring accuracy using regular exercises and vision exercises which indicate that it is the best method in scoring accuracy. The researchers found that the use of rubber bands and assisting means in training units as well as selection of training types and consistency to quality of training prepared by researchers contributed to scoring accuracy as these exercises work mainly in specialized sport (Ebidiy, 2010: p. 105).

Findings of the above tables show that there is a development in muscular strength of feet. The researchers attribute this development to the fact that this muscular strength is considered an important indicator and vital element of fitness in order to improve health. This strength developed noticeably because of training which depends generally on quality of rubber bands and the use of 3 types of bands: Red, blue and green as each color represents certain intensity. The red is for low intensity; the blue is for average intensity and the green is for high intensity based on the band's flexibility strength. "The use of rubber bands with various strengths duplicates training efficiency because they help

duplicate movement capacity in joints, and their use has a positive effect on scoring in football" (Magid, 1998: p. 78).

CONCLUSIONS

1. All exercises affect in developing scoring skills in football.
2. Regular training and vision training used by the second group are the best in developing scoring accuracy in football.
3. There is a significant difference between pre- and post-tests for all groups in favor of post-test.

RECOMMENDATIONS

1. Regular training and vision training can be adopted in developing scoring accuracy in football.
2. It is necessary to stress that increasing scoring during various training periods has a positive effect on scoring mastery.
3. It is necessary to conduct scientific studies and researches in using normal exercises and vision exercises to reach the best achievement through developing all basic football skills.

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ANNEX 1

Exercises using rubber:

1. Standing, raising arms up, fixing the band from ends with feet facing and holding the band from its ends, lowering arms to the side with a shield on the right eye.
2. Standing, arms forward, fixing band around trunks, running forward opposite the fixed end to the goal.
3. Standing, side arms, band around legs, alternative pulling feet forward.
4. Standing, opening arms forward, the band around one leg and fixed in a wall with raising legs upward.
5. Standing opening, fixing the band in legs and attempting to dribble the ball forward.
6. Standing, arms raised, band around legs, side opening of legs.
7. Standing, the band below right leg, the band is held from ends by hand and raised arms upward.
8. Standing, opposite, running between two colleagues in opposite direction.
9. Standing, open legs, fixing the band with both feet in a distance 40 cm and dribble the ball between posts.
10. Standing, open, fixing the band with both feet in a distance 50 cm and pass the ball on the wall.

The Effect of Competition Training on Developing Motor Energy of some Requirements of Skill Performance and Assertive Behavior for Handball Players of the Specialist Center in Diala

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ABSTRACT

This study aims to determine the effect of competition training on developing motor energy of some requirements of skill performance and its relation to the assertive behavior of handball players. Handball training should have suspense and competition to work on developing their performance levels. No doubt that this works to develop their motor energies. It is the term that is often circulated in dealing with sport practice for early ages as well as the youth. It is known that positive psychological atmosphere provided by sport practice in general and competition training affect physical abilities of the players. This leads to develop their internal energies represented in their motor energies reflected on their psychological characteristics during the performance. We selected the assertive behavior as one of the positive psychological characteristics that help players to develop the effectiveness of their fruitful performance. This motivated the researcher to study the relation of developing motor energy of players through competition training to increase their assertive behavior, which increases with the increase in the effectiveness of their physical abilities as the researcher believes. The sample was selected purposively consisting of 12 players from Diala Club Youth team to represent 75% of the population of the study represented in players of the specialist handball center who are 16 players. The study used the empirical method with the single group as it is appropriate to the objectives of the study. This method aims to collect facts and data about a certain phenomenon or situation with the attempt to explain these facts completely.

Keywords: Competitive training, motor energy, assertive behavior

INTRODUCTION

There are various performance requirements in handball, whether they are physical, mental, or psychological due to the nature of handball game which is characterized by high competitiveness to win through players' technical capabilities and related to physical aspects to form performances that reflect their motor energy

and crystallize their active sports bodies to beat the opponents. This could also with an assertive behavior represented in the selection of defensive skill or even offensive ones on time and at the right place, and this is incumbent on trainers to be taken into consideration and direct training curricula toward it to invest motor and psychological energy of athletes to win the game and thus the achievement of championships. It is known that competition training is one of the training methods, which depend on the game's requirements and conditions in determining training doses and depends on physical and psychological factors, the level of motor ability, skill level, psychological, and tactical ability.

This method is used for the development of physical, skills, or tactical elements during diverse games, and

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in particular, the elements and requirements of sport effectiveness. This is clearly evident in the team games by giving the terms in the direction to be achieved during the course of playing in its various forms with commitment to the law of specialist efficiency (Ibrahim, 2010: p. 144), making this training method an ideal one for the development of motor energy of athletes as well as mental abilities including the assertive behavior that is positively reflected on physical and technical performance.

Objectives of the Study

1. Define motor energy for some requirements of skill behavior for members of the sample of the study
2. Define assertive behavior for members of the sample of the study
3. Define the effect of competition training on developing motor energy for some requirements of skill performance, motor energy, and assertive behavior for members of the sample of the study.

Hypothesis of the Study

There are statistically significant differences between pre- and post-tests in motor energy in some requirements of motor energy and assertive behavior for members of the sample of the study.

METHODOLOGY

The study used the empirical method with the single group as “empirical research is characterized with accuracy and control of studied variables in a way that makes an intentional change in some of them and controls other variables as it is considered the only research methodology, which shows the relation

between cause and effect accurately (Mohamed and Kamel, 1999: p. 104).”

Population and Sample of the Study

The sample was selected purposively consisting of 12 players from Diala Club Youth team to represent 75% of the population of the study represented in players of the specialist handball center who are 16 players. To control variables of the study which accompany the research trial, the researcher extracted homogeneity to ensure closeness of sample in the study variables (age, length, and weight) as shown in Table 1.

Field Procedures of the Study

Determining tests used in the study

For the purpose of measuring the variables under study, it was a duty to determine the tests that are related to the phenomenon to be measured (Wagih, 2001: p. 201) and the researcher identified tests through the use of experts to identify research variables, which are best suited to the subject of study.

First, to extract motor energy values for each value related to performance requirements under study, the researcher resorted to treating results of all tests in the motor energy rule as it is a fixed rule through which it can be calculated as follows:

Motor energy = $1/2 \text{ mass} \times \text{speed}^2$ (Al Khaldi et al., 2010: p. 84) as mass is calculated from weight counted for each student individually and in pre- and post-tests from the mass rule.

Weight = Mass \times ground acceleration (Al Khaldi et al., 2010: p. 84). From the previous relation, we can extract that Mass = Weight/ground acceleration. Then, speed

Table 1: Homogeneity of sample in the study variables

Serial number	Statistical values/Study variables	Measurement unit	Arithmetic mean	SD	Median	Skewness coefficient
1	Age	Number	15.6	0.48	16	-2.5
2	Length	Cm	163.9	6.62	165.5	-0.72
3	Weight	Kg	61	4.17	61	رفص
4	Motor energy in bouncing speed	Joule	22.37	3.42	22.12	0.21
5	Motor energy in response speed	Joule	3.57	0.6	3.4	0.85
6	Motor energy in short defensive moves	Joule	11.06	1.18	10.58	1.22
7	Motor energy in transitional speed	Joule	28.62	5.23	29.01	-0.22
8	Assertive behavior	Degree	61.83	1.24	61.44	0.99

Skewness coefficient represents homogeneity of values on the line of numbers between (± 3). Table 1 showed that skewness coefficient values are between (± 3), so the sample of the study becomes homogeneous with natural distribution. SD: Standard deviation

shall be calculated through the exercises applied in the form of a test to measure the motor energy through the distance for as little time as possible, and this is by adopting of the following equation:

Speed = Distance/Time (Al Fady, 2010: p. 74).

Sarih refers that “The amount of movement depends not only on the body but also on speed multiplied by the mass, and thus, speed is included mainly at the expense of kinetic energy” (Al Fady, 2010: p. 74). Second, assertive behavior as a psychological variable, the researcher depended on a questionnaire form designed as a measurement of sport assertive behavior of players by Mohamed Hassan Allawi, 1998.

Motor Energy Tests for Some Requirements of Skill Performance

To extract motor energy for requirements of skill performance, the researcher performed treatment for each value of the following performance test values using the previously-mentioned motor energy rule. Therefore, we get motor values for multiple aspects included in skill performance requirements as follows:

First test: Transitional speed (Ali Salman, 2013: p. 92).

Second test: Bouncing speed (Al Anzi, 2009: p. 223).

Third test: Short-term defensive movements (forward, backward, lateral) (Diala and Nofal, 2001: p. 668).

Fourth test: Running right – Let 6 m from each side (Ali Salloum, 2004: p. 114).

Assertive behavior test (Al Yasseri, 2009: p. 66).

Exploratory Trial

The researcher performed the exploratory trial with the help of the assistant team at 4:00 pm on Sunday 10/11/2015 to perform study tests in the indoor hall of Diala governorate on four junior handball players of the specialist handball center at Diala Sporting Club from the same original population of the sample. They were eliminated from the main trial. The trial aimed to achieve the following:

1. Diagnosis of obstacles and negative sides that may face the researcher during test and measurement
2. Answering questions and queries specifically about assertive behavior scale
3. Knowing the time spent in performing tests and scale separately

4. Ensuring effectiveness and efficiency of the assistant work team.

Applying Tests

Pre-tests

After selecting the sample of the study, the researcher conducted some tests on Saturday 14/11/2015 at 4:00 pm in the indoor hall of Diala governorate noting that tests were made by the assistant team and under the supervision of a researcher. They explained testing procedures and clarified them to the research sample and distributed work on the assistant team. Then, tests of the study were conducted on a research sample, and results were recorded in a special form. Since the nature of search variables that relied on two-ways, one of them is the test by paper and pencil to measure the assertive behavior as a psychological variable, so they were conducted in the beginning before any action concerning performing variables represented by extracting motor energy through some skill performance requirements. This is to isolate the fatigue factor during answering paragraphs of the scale. The researcher also relied on the same principle to ensure respondent's comfort during skills performance tests and to ensure that each player has his role that allows him to get complete recovery.

Planning competition training

Aiming to build research trial is build depending on competition training method as an effective training method; the researcher resorted to planning training related to achieving the study objectives through similar training in handball. Through this training, the researcher ensures the presence of competitors in attack and defense. The purpose here is to put a set of sequential training units based on training principles in gradual difficulty to make differences in the study variables. We should consider that training doses of the used training course is a part of the training modules to develop skills abilities of handball, reflected positive mental capabilities on him. One of them is the assertive behavior, and the location of training doses of the variables of research is within the main section in the part dedicated to the development of skills abilities in the training unit of the trainer's approach. To apply the proposed exercise, the researcher conducted the following steps:

First: Setting general parameters of the proposed training course

- The training method under study
- The used training methods

- The goal of training is to develop motor energy for some requirements of handball skill performance
- Training application duration: 8 weeks
- Number of training units: 24 training units (3 training units/week)
- Training duration: 45 min (total duration for all proposed exercises is 1080 min)
- Training intensity: 75-85%
- Repetitions: 3-5 times of the single training
- The used rest: 30 s to 2 min
- Mechanism of legalizing training load: Performance duration.

Second: Applying the proposed training

The researcher started by applying competition training on members of the empirical group on Monday 16/11/2015 at the sports hall for the young at Diala Sporting Club after completing pre-tests on the empirical and control groups. To control outsider variables, the researcher considered individual differences among players in applying the special training. The researcher was supervising method application. Training days were Saturday, Monday, and Thursday. It is noteworthy that the session of the research variable (competition training) was 45 min for the single training unit out of a total duration of the training unit (1080 min).

As for training units intensity related to the proposed method and relation between loads and rests, the researcher considered grading and variability in this relation. He manipulated the training load components

represented in performance duration and number of groups for the purpose of making training waves that reach the best adaptations for members of the empirical sample of the study.

Post-tests

The researcher conducted post-tests on 17/01/2016 corresponding Sunday. He depended on the same procedures adopted in pre-tests to control outsider variables.

PRESENTING, ANALYZING, AND DISCUSSING RESULTS

Arithmetic means and standard deviations (SD) for skill performance requirements (Table 2).

Arithmetic means, SD of differences, calculated and tabulated (T) values, and statistically significant differences between pre- and post-tests in skill performance requirements for members of the study sample (Table 3).

Arithmetic means and SD of assertive behavior for members of the study sample (Table 4).

Results of arithmetic means, SD of differences, calculated and tabulated (T) values, and statistically significant differences between pre- and post-tests in assertive behavior for members of the study sample (Table 5).

Table 2: Arithmetic means and SD for skill performance requirements

Serial number	Variables	Measuring units	Mean±SD	
			Pre-test	Post-test
1	Motor energy through bouncing speed	Joule	22.37±3.42	27.37±3.33
2	Motor energy through response speed	Joule	3.57±0.6	5.65±0.76
3	Motor energy through defensive movements	Joule	11.06±1.18	15.18±1.16
4	Motor energy through transitional speed	Joule	28.62±5.23	33.5±3.66

SD: Standard deviation

Table 3: Arithmetic means, SD of differences, calculated and tabulated (T) values, and statistically significant differences between pre- and post-tests in skill performance requirements for members of the study sample

Serial number	Variables	Measuring units	Mean±SD	(T) value		Significance
				Counted	Tabulated	
1	Motor energy through bouncing speed	Joule	5.00±2.45	5.77	2.20	Significant
2	Motor energy through response speed	Joule	2.08±0.94	10.84		Significant
3	Motor energy through defensive movements	Joule	5.68±1.85	1.28		Random
4	Motor energy through transitional speed	Joule	4.87±2.99	4.6		Significant

Tabulated (T) value at freedom degree (11) and significance level (0.05) was 2.20. SD: Standard deviation

DISCUSSING RESULTS

Tables 3 and 5 about arithmetic means, SD of differences, calculated and tabulated (t) values, and statistically significant differences between pre- and post-tests in skill performance requirements and assertive behavior for members of the empirical group members. Findings showed that there is significance among all variables of the study except motor energy through short-term defensive movements. Thus, the study achieved hypothesis of the study by the researcher based on the problem of the study represented in non-direction of training courses toward developing motor energy for skill performance requirements and the necessity to direct this motor energy to be reflected on psychological aspect. This is to invest motor and psychological energy of athletes to reach winning the match. The researcher believes that these results are logical due to the adoption of competition exercises that create an atmosphere of competition which contributes to the player or athlete's maximum physical and skill potential to do the training. This is what is necessitated by the existence of opponents during a workout aiming to the effectiveness of its technical performance that is represented in an increase in his motor energy and related self-efficiency and physical confidence. This leads to the development of his assertive behavior which makes the athlete employs his performing potential as part of the related rule of the game. This is consistent with what was said by "Hassan and Abdulhady" that "the athletic field that meets the spirit of fun, competition and develops motivation has the biggest impact in training sports movements and skills (Hassan and Abdulhady, 2014: p. 137)." The researcher believes that the development of motor energy of variables under study was the result of high-intensity training loads within limits of the

influencing load. This led to raise potentials of athletes in the motor energy of various forms of skill performance. This was confirmed by Darwish et al. that "increasing the size of resulting energy during physical or motor exertion doubles of what it was in during the rest in proportion to the load effort (Darwish et al., 1998: p. 37)."

As for insignificance of differences of motor energy during defensive movements, the researcher finds that the reason is that defensive training is characterized by being difficult for players in terms of not possessing the ball. This leads to a heavy training load for athletes as it does not include high motivation of performance even if included in competition method. This, in turn, was reflected on the insignificance of differences between pre- and post-differences in the motor energy of defensive movements. However, there are slight differences through comparing values of arithmetic means. Thus, the increase in an athlete's physical efficiency represented in raising his motor energy level led to higher confidence in his abilities which makes him act psychologically positive represented in increasing assertive behavior. This agrees with Al Yasserri, who refers that "players who have good competitive orientation, it will be accompanied with a behavioral motivation for players in their competition performance. Therefore, their potential of optimal performance will increase when they perform matches (Al Yasserri, 2009: p. 68)."

Table 4: Arithmetic means and SD of assertive behavior

Variables	Measuring units	Mean±SD	
		Pre-test	post-test
Assertive behavior	Degree	61.83±1.42	76.12±1.5

SD: Standard deviation

Table 5: Results of arithmetic means, SD of differences, calculated and tabulated (T) values, and statistically significant differences between pre- and post-tests in assertive behavior for members of the study sample

Variables	Measuring units	Mean±SD	(T) value		Significance
			Counted	Tabulated	
Assertive behavior	Degree	14.36±1.92	25.92	2.20	Significant

Tabulated (T) value at freedom degree (11) and significance level (0.05) was 2.20. SD: Standard deviation

CONCLUSIONS

1. Competition training has a positive effect on physical, technical, and psychological aspects of handball players
2. Competition training has a positive effect on motor energy of skill performance of handball players
3. Competition training has a positive effect on the assertive behavior of handball players.

RECOMMENDATIONS

1. Using competitive training to develop technical and tactical performance of handball players

2. Conducting similar studies to define competition training on the rest of performance requirements
3. Considering purposeful training to develop players' motor energy based on various training methods to select the best
4. It is necessary to consider the development of physical abilities of the athletes through stressed training loads.

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Original Article

The Effect of Prograded Education on Learning Some Basic Skills in Handball and Basketball for the 1st Stage Students in Faculty of Basic Education

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ABSTRACT

Prograded education is one of the modern methods with an effective impact on learning. Here, the significance of the study through the researchers' vision to necessitate employment of prograded education method in learning handball and basketball skills. Through researchers' observation of the educational process in the Faculty of Basic Education being members in its teaching staff, they noticed a decrease in the skill learning level in handball and basketball subjects. This is due to a lack of using appropriate teaching methods in the faculty to achieve effective education. Hence, the researchers decided to study this problem using modern teaching methods including prograded education and its effect on intelligence level in teaching basketball and handball subjects for the 1st stage students at the Faculty of Basic Education. The study aims to determine intelligence level of the 1st stage students in the Faculty of Basic Education, Al-Mustansiriya University and determine the effect of prograded education on intelligence level of teaching basketball and handball subjects for the 1st stage students. The study concluded that the proposed educational method by researchers based on prograded education was greatly effective in enhancing learning of both skills under study. In addition, it was found that the adopted course was not efficient enough to enhance learning level of members in the control group and for both skills under study.

Keywords: Prograded education, basic skills, basketball, handball

INTRODUCTION

Significance of the Study

The educational process, its related basics, theories and rules are of the important aspects required to be known by teachers and physical education trainers to be studied accurately and objectively. Curricula of physical education include motor education subject

which, in turn, includes a lot of educational methods, concepts, and topics related to teach events and skills of various individual and team sport games as they are prepared through scientific and practical means that connect theoretical and applied sciences. Therefore, the physical education subjects, including motor education, have a positive influence in sports and high efficiency in educational and sport field. It became necessary during organizing units of the educational and training practice of sport events and games to consider how to benefit from applications of this essential subject. Educational units contribute to types of motor exercises and information toward learners, whether players or new learners. These are selected to be consistent with each skill to be enhanced and to improve their motor requirements in developing motor memory of the

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learner through presentation and explanation of how to apply correct motor paths of target abilities or skills. Thus, this helps learners implement and learn new skills and movements more easily, quickly and with less effort. This also shows that programed education is one of the modern methods with effective influence on learning. Here, the significance of the study lies through researchers' vision of the necessity to employ programed education in learning basketball and handball skills.

Problem of the Study

To reach high levels of learning including scientific developed methods and strategies that respond society's growing requirements through which learners are able to acquire useful information facing new situations, consideration of teaching methods and strategies may make students active, energetic and interactive in learning process. It also helps teachers and learners achieve their planned goals.

Programed education is one of these modern and latest methods as it refers to a new method in self-learning in which a learner's behavior is regulated through an educational program leading learners step-by-step toward the hoped learning. Through researchers' observation of educational the process in the Faculty of Basic Education being members in its teaching staff, they noticed that there is a decrease in skill education in basketball and handball subjects due to the lack of using suitable teaching methods in the faculty to achieve effective education. Thus, they decided to study this problem using modern teaching methods including programed education and its effect on intelligence level in teaching handball and basketball subjects for the 1st stage students at the Faculty of Basic Education.

Objective of the Study

The study aims to define the effect of programed education on the level of teaching handball and basketball from jumping skills for the 1st stage students at the Faculty of Basic Education.

METHODOLOGY

The researchers used the empirical method as it is appropriate to the nature of the study. Equal groups were selected (two possible groups), and the empirical method included all procedures and actions in research based on prior intention in all surrounding conditions of a certain phenomenon (Obaidat et al., 1999: p. 40).

Population and Sample of the Study

The researchers selected the sample of the study purposively from the 1st stage students in the Faculty of Basic Education, Al-Mustansiriya University, evening section for the academic year 2013-2014. Members of the sample were 20 students after eliminating those whose answers were not complete.

Tests

1. Scoring from jumping after bouncing test (Hamoudat and Hamoudat, 1978: p. 233).
2. Scoring from jumping in handball (www.m5zn.com).

Exploratory Trial

The researchers performed the exploratory trial as a beginning of their work to determine negative sides and obstacles that may accompany the trial as the exploratory trial means (an initial empirical study by the researcher on a small sample aiming to select research methodologies and tool (Arabic Language Compound, 1984, 79). The researchers distributed test forms on a random sample outside the study sample from the 1st stage students – morning classes' 15 thousand students to determine difficulties that may face the researcher in his main work. It was also found that it is necessary to detect scientific conditions of test as a beginning of work. They also found the following:

1. Validity: The test is considered "valid" if it measures what it was prepared to measure (Al-Assaf, 1988: p. 429). The researchers depended on superficial validity as one of the common validity types. This form was presented on a number of specialists in psychology field from universities to decide validity with agreement percentage of 100%.
2. Reliability: Reliability is one of the main factors of good testing as it is supposed to give almost the same results if it is reused again at different times (Abdel-Hadi, 1991: p. 159). It also means that if a test gives the same results in each time it necessitate similar surrounding conditions of test application (Salam, p. 219). The researchers used reliability coefficient by internal consistency method for the form, which is known as Cronbach's alpha coefficient on six of sample members with a reliability percentage of 98.99%.
3. Objectivity: The test with specific questions and specific answers, in a way that each question has one answer without any room for conflict is considered objective.

Main Trial

Pre-tests

The researchers conducted pre-tests for both groups of the study (control and empirical groups) at 10 AM of Thursday 13/02/2014 in the sport hall of Faculty of Basic Education, Al-Mustansiriya University.

The educational course

The educational course prepared by the researchers was implemented on the empirical group during the second semester of the academic year (2013-2014) as the program continued to apply for the period from 02/17/2014 to 28/04/2014. Linear method was adopted in learning skills under study through displaying those skills in educational films with the focus on the principle of hierarchy in presenting skills by skill segmentation and asking learners to perform these parts and then link them. After making sure of the stability of the motor program, the course moved into the complication stage of the skill at advanced stages.

Post-tests

After completing application of the educational course, the researchers conducted post-tests at 10 O'clock on thursday morning 01/05/2014 at the sports hall of

Faculty of Basic Education, Al-Mustansiriya University for both groups of the study.

Presenting, Analyzing and Discussing Results

Presenting, analyzing, and discussing results of pre- and post-tests for the empirical and control groups.

After performing statistical processes, the counted (T) value was extracted (11.89). Results showed significance in favor of the post-test after comparison with the tabulated (T) value, while total differences between pre- and post-test of the test of scoring from jumping after bouncing for the control group is 1 with total differences square of 13. As for average differences, it was 0.1 and standard deviation of differences average is 0.37. After performing statistical processes, the counted (T) value was extracted (0.27) and compared with the tabulated one shoeing significant results. The researchers attribute this to the clear effect of prograded education on intelligence level as (factors which increase subject retention after treatment are Motivation, intelligence, subject organization, and studying method) (Muska and Sare, 1994: p. 21).

The reason for the excellence of the empirical group over the control one is the use of prograded education

Table 1: Arithmetic means, SD of pre-and post-tests for scoring from jumping after bouncing in basketball for the empirical and control groups

Tests	Measure units	Groups	Pre-test		post-test	
			Mean-	SD±	Mean-	SD±
Scoring from jumping after bouncing in basketball	Points	Empirical group	2.2	0.927	6.6	1.414
		Control group	1.6	1-	1.5	1.303

Freedom degree (N-1=0). SD: Standard deviation

Table 2: Total differences, average differences of arithmetic means, SD, counted and tabulated T values for pre-and post-tests in scoring from jumping after bouncing in basketball for the empirical and control groups

Tests	Groups	Total difference	Total difference 2	Difference -	SD	Counted T value	Significance	Tabulated T value
Scoring from jumping after bouncing in basketball	Empirical group	44	206	4.4	0.37	11.89	Significant	1.83
	Control group	1	13	0.1	0.37	0.27	Insignificant	1.83

Freedom degree (N-1 = 0) and significance level (0.05). SD: Standard deviation

Table 3: Arithmetic means, SD of pre-and post-tests for the empirical and control groups in handball

Tests	Measure units	Groups	Pre-test		Post-test	
			Mean-	SD±	Mean-	SD±
Scoring from reverse basketball	Points	Empirical group	1.3	1.581	6.3	1.013
		Control group	1	0.866	1.3	0.500

SD: Standard deviation

in teaching basketball skills as (prograded education is based on the principle of considering individual differences as these differences are directly considered if it is available for each learner to self-learn according to his abilities and readiness. This is because his learning degree in social education scope may not allow him the opportunity to learn according to these abilities and preparations) (Shelton and Ali Khafajah, 2002: p. 120).

After performing statistical processes, the counted (T) value was extracted (0.90). Results showed insignificance after comparison with the tabulated (T) value. The researchers attribute this to the fact that most teachers teach handball skills through explanation and presentation, and this method does not consider individual differences between learners and insufficient to teach skills to reach a better learning level. One of the most important conditions for successful education process is to consider individual differences between learners and benefit from positive activity of mental and physical processes being carried out by the learner through actual participation in the learning process (education through oral demonstration and presentation through the use of films, photos, teaching, and visual means in the case of not getting the desired result in the absence of the individual learner who participates actively in the educational process) (Othman, 1987: p. 12).

Presenting and Discussing Results of the Post-test for the Control and Empirical Groups

From Table 5, with respect to skill of scoring from jumping in basketball, it is clear that mean has been

reached (6.6) and standard deviation (1.414), while using prograded education method, arithmetic average was 1.5, and standard deviation is 1.303 with no significant difference between the two groups found as the calculated value (T) was 7.97 which is greater than the tabulated value of (T) amounting to 1.83 below significance level (0.05). This confirms the presence of a significant difference between the two groups in favor of the empirical group. In terms of the skill (Handball test), the mean of the empirical group was 6.3 and standard deviation (1.013), and the arithmetic mean of the control group amounted to 1.3 and standard deviation (0.500), the presence of significant difference between the groups was found the calculated (T) value was 13.28 which is greater than the tabulated (T) value amounting to 1.83 below significance level (0.05). This confirms the existence of significant difference between the two groups in favor of the empirical group as a result of using prograded education method. The researchers attribute the reason for that is because of the use of prograded education as it is characterized by motivating learners to perform an action as it (works depending on its average as it does not move to any frame of skill unless perfected the previous skill. In all cases, each correct response issued is reinforced immediately and directly and also alerts the learner to any error at once) (Sadeq and Hatab, 1980: p. 401).

CONCLUSIONS

1. The proposed educational method by the researchers based on prograded education was greatly effective

Table 4: Total differences, average differences of arithmetic means, SD, counted and tabulated T values for pre-and post-tests in handball for the empirical and control groups

Tests	Groups	Total difference	Total difference 2	Difference-	SD	Counted T value	Significance	Tabulated T value
Scoring from jumping in hand ball	Empirical group	50	282	5	0359	8.47	Significant	1.83
	Control group	3	11	0.3	0.33	0.90	Insignificant	1.83

Freedom degree (N-1 = 9) and significance level (0.05). SD: Standard deviation

Table 5: Arithmetic means, SD, average differences, T value and significance between the empirical and control groups in post-test

Variables	Empirical group		Control group		Average deviation	Calculated value of T	Semantics
	Mean-	SD±	Mean-	SD±			
Scoring from jumping in basketball	6.6	1.414	1.5	1.303	1.45	7.97	Significant
Scoring from jumping in handball	6.3	1.013	1.3	0.500	0.72	13.28	Significant

SD: Standard deviation

in making enhancement in the level of learning both skills under study

2. The adopted method was not sufficient enough to make improvement in learning level for members of the control group and both skills under study
3. Students of the empirical groups showed a greater learning level than students of the control one and both skills under study.

RECOMMENDATIONS

1. The researchers recommend inclusion of approved educational programs in teaching basic skills of handball and basketball subjects through prograded education
2. The researchers recommend conducting similar studies focusing on the use of prograded education as a method to learn basic skills of other games and events.

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